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HEWLETT-PACKARD
SOUTHERN SALES DIVISION
2112 SPENCER RD
RICHMOND, VIRGINIA 23230

IM/S/M

5100A FREQUENCY SYNTHESIZER

OPERATING AND SERVICE MANUAL

HEWLETT  PACKARD

CERTIFICATION

The Hewlett-Packard Company certifies that this instrument was thoroughly tested and inspected and found to meet its published specifications when it was shipped from the factory. The Hewlett-Packard Company further certifies that its calibration measurements are traceable to the U.S. National Bureau of Standards to the extent allowed by the Bureau's calibration facility.

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OPERATING AND SERVICE MANUAL

MODEL 5100A FREQUENCY SYNTHESIZER

SERIALS PREFIXED: 540-

This manual applies directly to  Model 5100A Frequency Synthesizers with serial number prefix 540-.

OLDER INSTRUMENTS

This manual with changes outlined in Appendix I also applies to older Model 5100A instruments with serial number prefix 520-, 442-, 427-, 420-, 408-, 401-, or 351- (see Paragraph 1-22).

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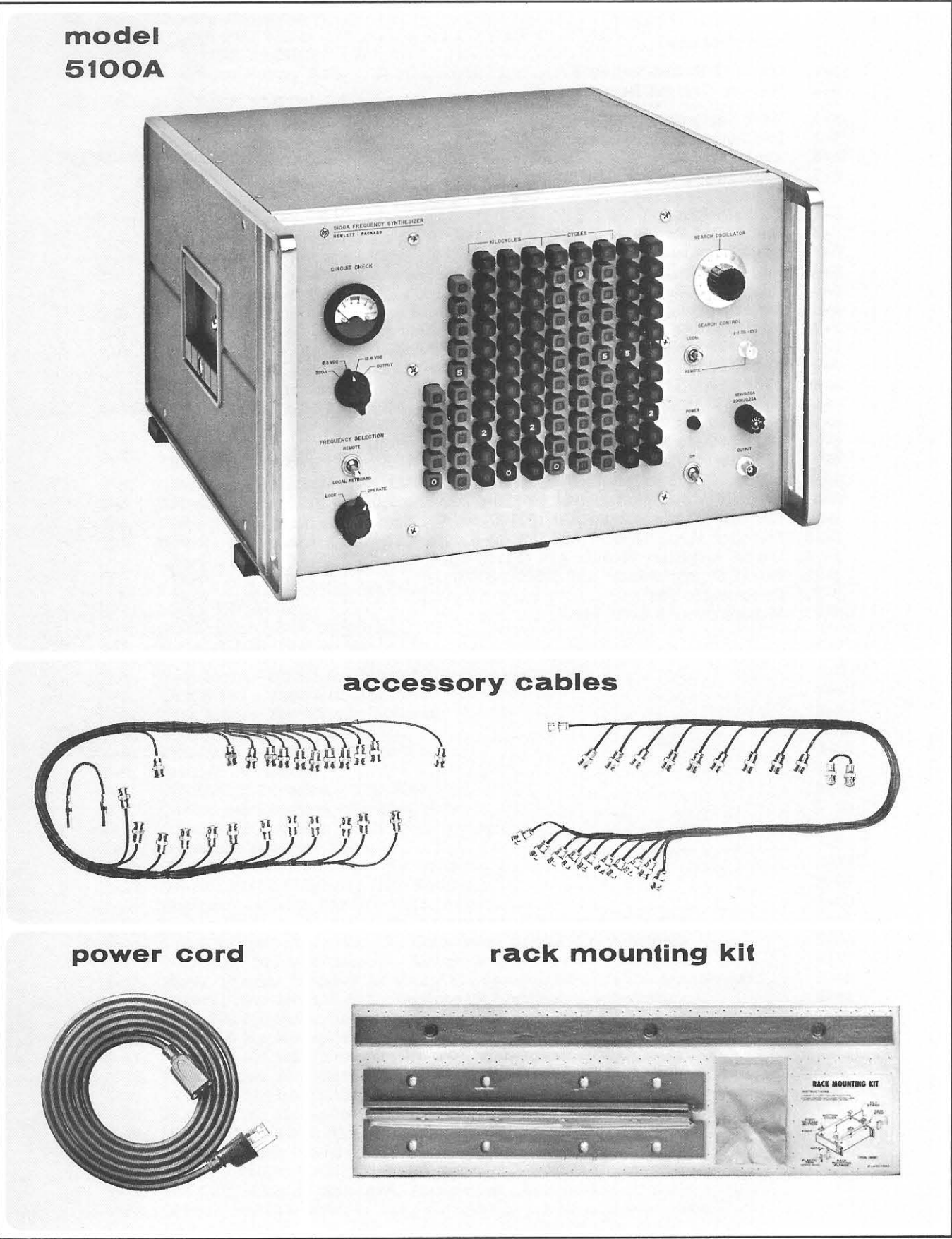


Figure 1-1. Model 5100A and Accessories

SECTION I

GENERAL INFORMATION

1-1. INTRODUCTION.

1-2. The Model 5100A Frequency Synthesizer, when driven by the Model 5110A Synthesizer Driver, provides any output frequency from 0.01 cps to 50 Mc, selectable in steps as small as 0.01 cps. The output frequency is selected by ten columns of pushbuttons, arranged for rapid frequency selection, or by remote contact closures. The output frequency is derived from a precision single frequency source through direct synthesis, a technique which translates the long-term stability and spectral purity of the source to the selected output.

1-3. A very clean output signal is provided over the entire frequency range. A high order of spectral purity is essential for accurate doppler measurements, microwave spectroscopy, narrow band telemetry or communications, and similar applications. It is possible to obtain output signals with a spurious content at least 90 db below the selected output.

1-4. The 5110A Synthesizer Driver generates twenty-two spectrally pure signals from the standard signal. These twenty-two frequencies are then fed to the 5100A Frequency Synthesizer by means of rear panel BNC connectors (Figure 2-2), and are continuously available. The variable output signal is synthesized from these fixed frequencies by a series of arithmetic operations.

1-5. Since no phase-locked loops are involved, switching from one output frequency to another can be accomplished very rapidly, either from the front panel pushbuttons or remotely. Less than one millisecond is required to change output frequency. The two oscilloscope trace reproductions in Figure 1-2 are typical results. For applications requiring rapid frequency selection, the Model 5100A is arranged for remote control through rear connectors.

1-6. OPERATIONAL FEATURES.

1-7. REMOTE CONTROL.

1-8. Less than one millisecond switching time offers wide control flexibility. Any frequency or search oscillator position that can be selected by front panel pushbuttons may also be remotely selected. Three fifty-pin connectors located on rear panel (Figure 3-2) provide pins corresponding to each front panel pushbutton position, a ground connection, and a -12.6 volt line for use in remote programming. The -12.6 volts is available in two arrangements--continuous and switched (present when REMOTE mode is selected at front panel). This lends additional versatility since it enables the use of a combination of remote and local programming.

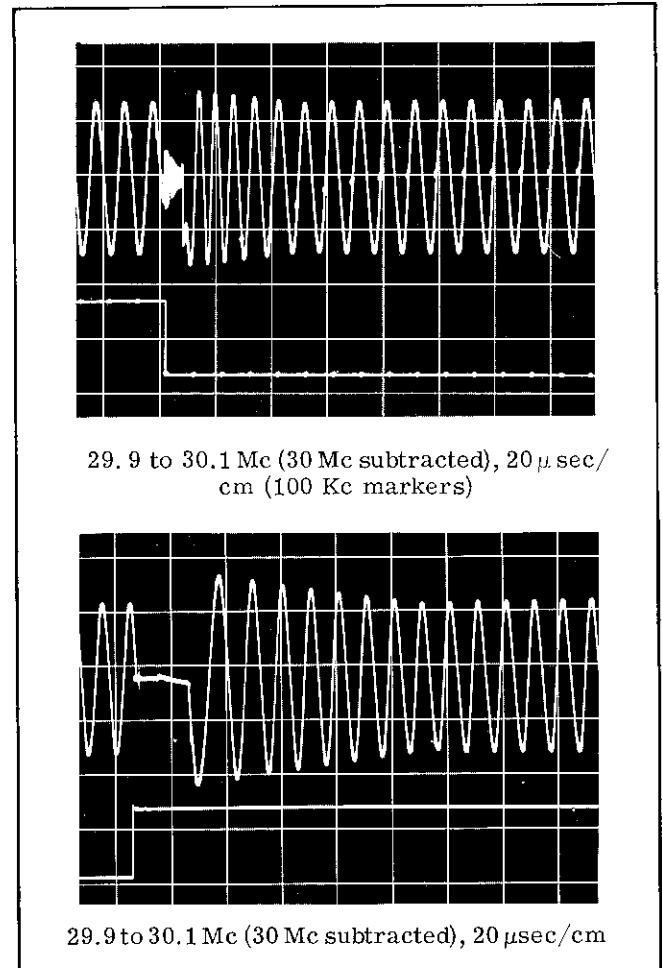


Figure 1-2. High Speed Switching

1-9. An actual contact closure such as a relay is not required for remote control of the Synthesizer. The required -12.6 volts dc may be applied to the selected pin electronically.

1-10. Figure 1-3 is representative of one of the many applications made possible by the Synthesizer's remote programming capability. This plot of the response of a single sideband crystal filter was obtained by programming the Synthesizer to generate frequencies in a variety of incremental steps. Less than one minute was required for the complete plot.

1-11. SEARCH OSCILLATOR.

1-12. Continuous tuning and sweep capability adds versatility for a wide variety of applications. The search oscillator is an L-C oscillator which allows the operator to continuously "search" any significant column from 100 Kc to 0.01 cps, either manually by

Table 1-1. Specifications

OUTPUT FREQUENCY: Dc to 50 Mc.

DIGITAL FREQUENCY SELECTION:

0.01 cps through 10 Mc per step. Selection by front panel push-button or by remote switch closure. Any change in frequency may be accomplished in less than 1 millisecond.

OUTPUT VOLTAGE:

1 volt rms ± 1 db from 100 Kc to 50 Mc. 1 volt rms $+2$ db, -4 db from 50 cps to 100 Kc, into a 50-ohm resistive load. Nominal source impedance is 50 ohms. 15 millivolts rms minimum open circuit from 100 Kc down to dc, at separate rear output connector, source impedance of 10,000 ohms with shunt capacitance approximately 70 pf.

SEARCH OSCILLATOR:

A search oscillator provides continuously variable frequency selection with an incremental range of 0.1 cps through 1 Mc. Manual or external voltage (-1 to -11 volts) control with linearity of $\pm 5\%$.

SIGNAL-TO-PHASE NOISE RATIO:

Greater than 54 db in a 30-Kc band centered on the signal (excluding a 1 cps band centered on the signal).

SIGNAL-TO-AM NOISE RATIO (above 100 Kc):

Greater than 74 db in a 30-Kc band.

RMS FRACTIONAL FREQUENCY DEVIATION

(with a 30-Kc noise bandwidth):

Averaging Time	Output Frequency			
	1 Mc	5 Mc	10 Mc	50 Mc
10 ms	3×10^{-8}	6×10^{-9}	3×10^{-9}	6×10^{-10}
1 second	3×10^{-8}	6×10^{-11}	3×10^{-11}	1×10^{-11}

SPURIOUS SIGNALS:

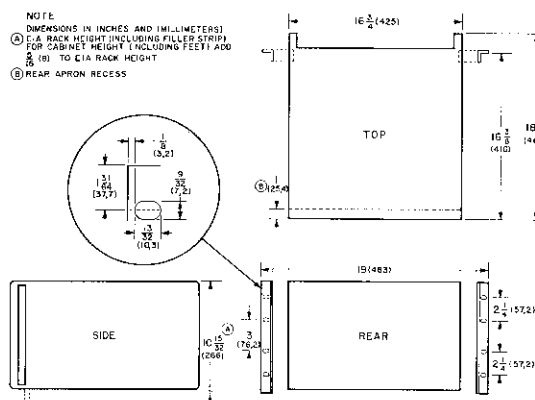
Non-harmonically related signals are at least 90 db below the selected frequency.

HARMONIC SIGNALS:

30 db below the selected frequency (when terminated in 50 ohms).

Note: When the 5110A Driver utilizes an external frequency standard, this will affect the stability and spectral purity of the output. Performance data stated above are based on internal frequency standard or indicate Synthesizer contribution to overall performance with external standard.

DIMENSIONS:



WEIGHT: Net 75 lbs (34 kg)

Shipping 127 lbs (58 kg)

EQUIPMENT FURNISHED:

05100-6180 Decade Test cable, 05100-6066 output cable, 05100-6212/13 cable assembly connects 5100A Synthesizer to 5110A Driver. Permits rack mounting of up to two 5100A's immediately above and/or below the 5110A Driver. A special-length cable assembly will be required for other mounting arrangements.

SPECIAL CABLE:

If a special-length cable assembly is required, order spec C05-5110A. Specify configuration and length (max separation 50 feet). Cable is supplied in five-ft. sections only.

GENERAL

OPERATING TEMPERATURE RANGE: 0 to $+55^{\circ}\text{C}$.

INTERFERENCE:

Complies with MIL-I-26600, Class 1 and 3, MIL-1-6181D.*

SUSCEPTIBILITY:

Complies with MIL-I-26600, Class 1 and 3, MIL-I-6181D.

POWER:

115 or 230 volts $\pm 10\%$, 50 to 400 cycles, 35 watts each unit (independent supplies).

* Interference compliance requires that the 5100A and 5110A are connected by a low inductance path such as adjacent rack mounting.

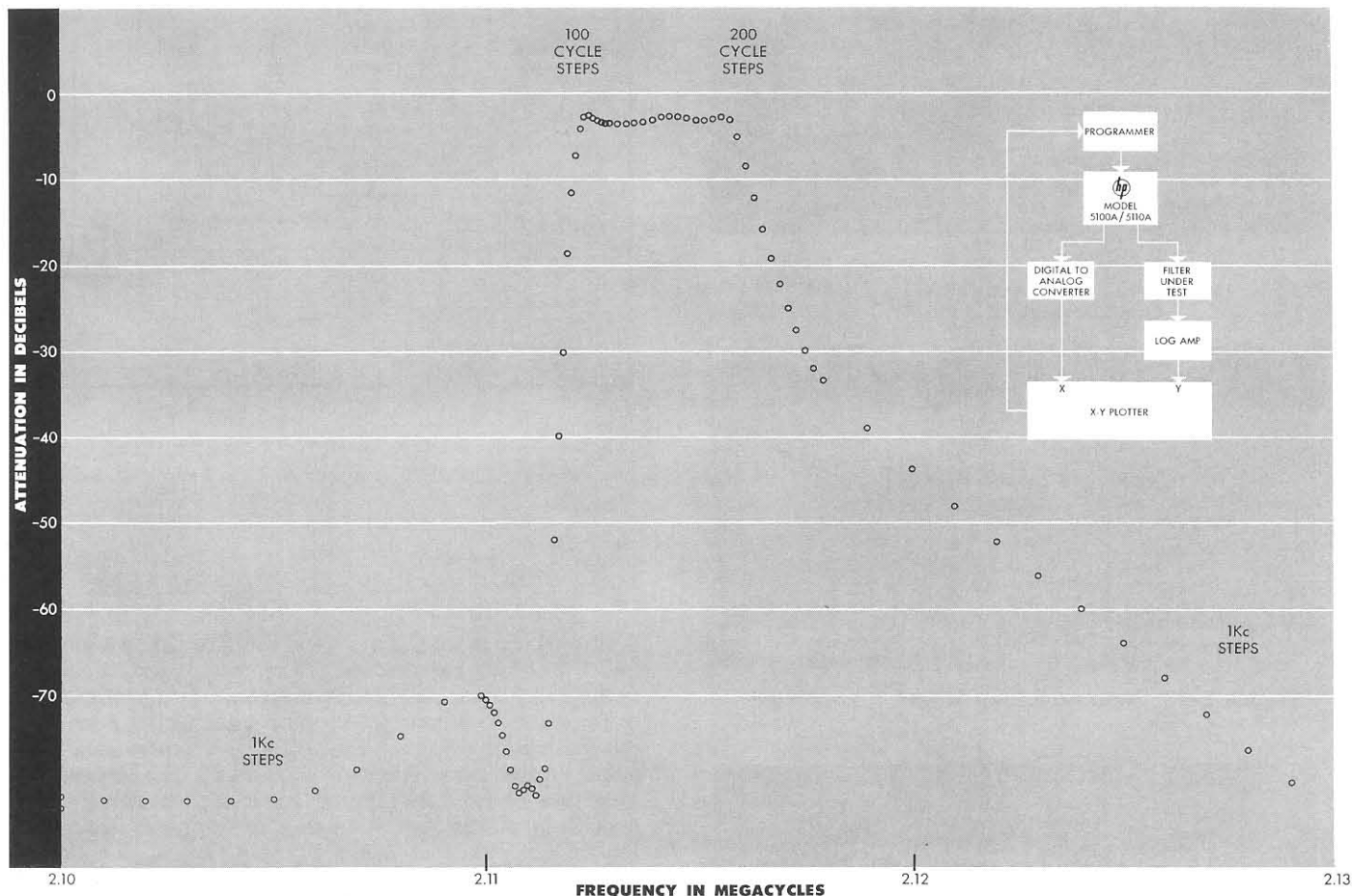


Figure 1-3. Crystal Filter Response Plot

front panel dial or remotely by application of a suitable voltage. The typical voltage vs frequency characteristic is shown in Figure 1-4. The approximate slope is 10% of the selected column's range per volt.

1-13. If the search oscillator is used, the stability of the Synthesizer output is determined by either that

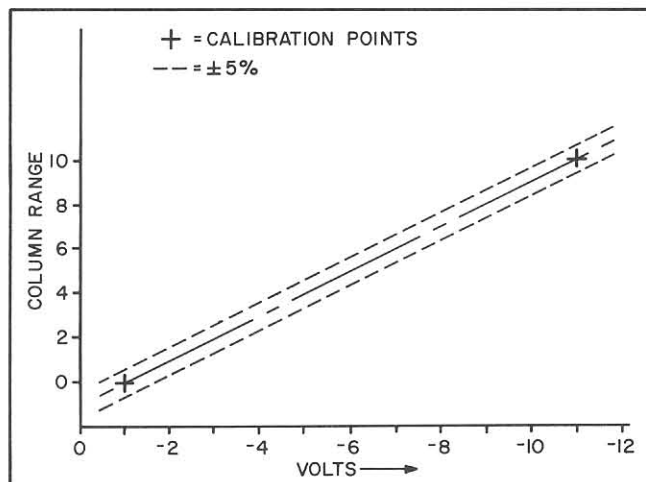


Figure 1-4. Voltage vs Frequency Characteristics of the Search Oscillator

of the standard instrument or that of the search oscillator. The search oscillator has a root-mean-square deviation of approximately 1 cycle (one second average) if used in the most significant column that can be searched (100 Kc steps). This Δf_{rms} is reduced by a factor of 10 for each less significant column that is searched. As an example, consider that the search oscillator is used in the 10 Kc step column, at an output frequency in the 10 Mc region. The instability in the output frequency due to the search oscillator is then:

$$\frac{\Delta f_{rms}}{\Delta f_{out}} = \frac{0.1 \text{ cps}}{10 \times 10^6} = 1 \times 10^{-8}$$

At this output frequency, and using one second averaging, the short term stability of the Synthesizer itself is on the order of 3×10^{-11} . Consequently, the search oscillator governs in this case.

1-14. The search oscillator may be frequency modulated from an external source (sinewave) at a maximum rate of 1 Kc while retaining the voltage control calibration.

1-15. The plots displayed in Figures 1-5, 1-6, and 1-7 are representative of the impressive versatility of

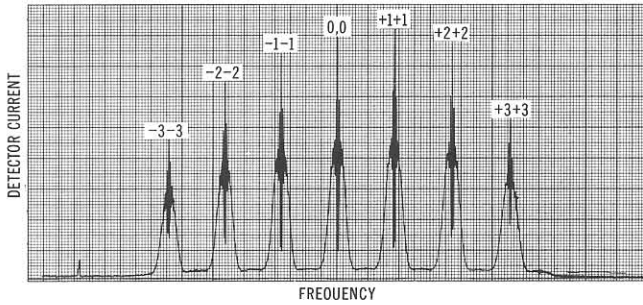


Figure 1-5. Spectral Lines of Cs^{133}

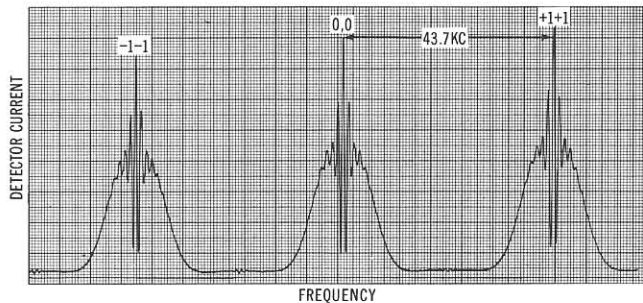


Figure 1-6. Spectral Lines of Cs^{133} Expanded

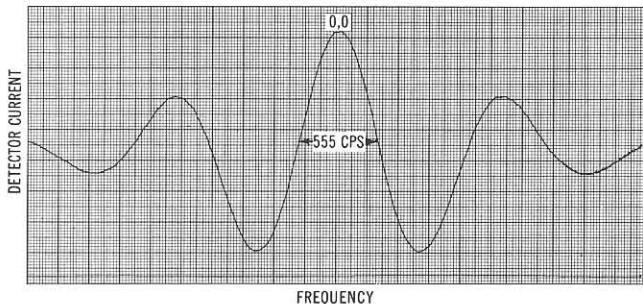


Figure 1-7. Spectral Lines of Cs^{133} Expanded Further

the Frequency Synthesizer. The microwave spectral lines of Cs^{133} were obtained using the system shown in Figure 1-8.

1-16. The frequency translator adds the Synthesizer output to a fixed harmonic of the stable 5 Mc source to provide an excitation frequency of 9192+ Mc. A desired significant column of the Synthesizer output is continuously swept by employing the external voltage control feature of the Synthesizer's search oscillator. The three plots were obtained by searching successively less significant columns. This type of system greatly simplifies the investigation of the homogeneity of the small magnetic field used in the region where Cesium hyperfine transitions occur. For further details see the Hewlett-Packard Journal, Vol. 15, No. 15, Dec. 1 1963.

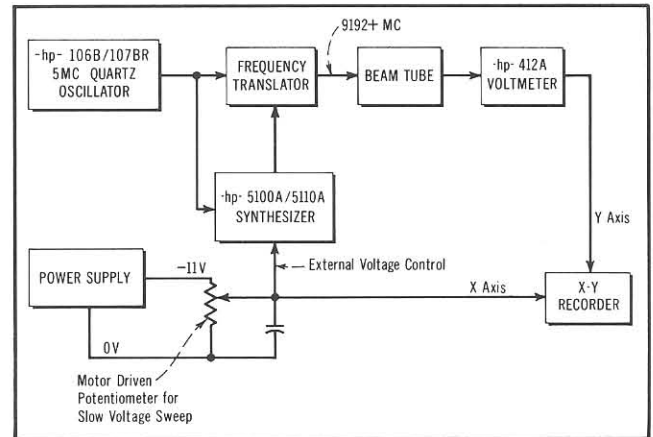


Figure 1-8. System Used to Obtain Spectral Lines of Cs^{133} shown in Figures 1-5, 1-6, and 1-7.

1-17. SPECTRAL PURITY AND SHORT TERM STABILITY.

1-18. Many applications require that a signal be multiplied into the microwave region. If the frequency multiplying device is broadband, the ratio of total sideband power to signal power increases as the square of the multiplying factor. Since the total power in a frequency modulated wave is constant, the increased sideband power must come from the carrier. The spectrum of the signal begins to "spread" since the increased sideband amplitude causes the intermodulation between sidebands to become appreciable. It is desirable, then, that the original signal have the highest possible signal to phase noise ratio. Figure 1-9 shows the log plot of phase noise present on the output signal of the 5100A/5110A at 49 Mc. Figure 1-10 is a wave analyzer's approximation to the voltage spectrum of a 1 Kc beat between two independent synthesizers individually multiplied from 2.2 Mc to 8.75 Gc. Narrow width here of <1 cps indicates the high quality of the original synthesizer signal.

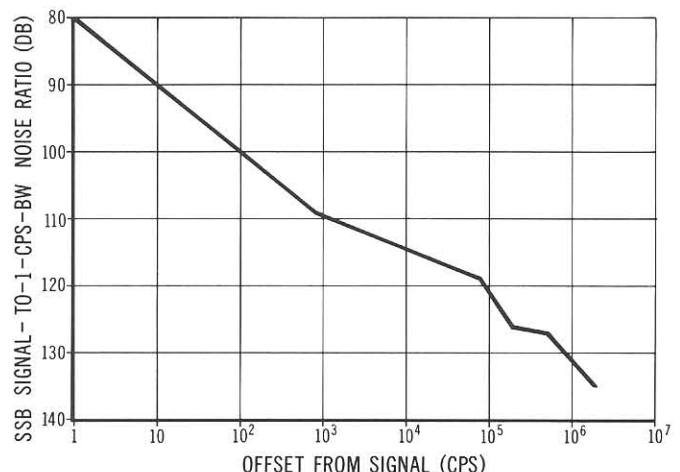


Figure 1-9. Log Plot of Phase Noise on Output Signal of 49 Mc

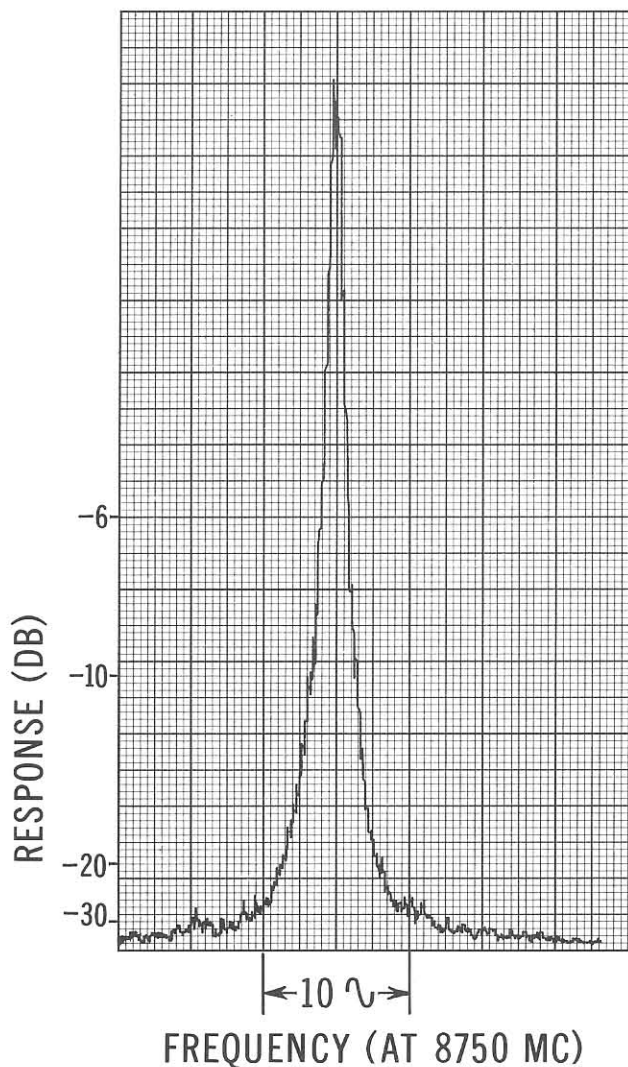


Figure 1-10. Narrow Width Indicates High Quality of Original 5110A Signal

1-19. The specified values for RMS fractional frequency deviation at various averaging times and at various output frequencies represent the standard deviation of the short term frequency instability due to random noise. For example, the value given for one second averaging at an output of 50 Mc is 6×10^{-11} . This corresponds to an RMS or standard frequency deviation of 0.0030 cps. In other words, 68.3% of all observed frequency variations for measurement times of one second will differ from the carrier by less than plus or minus that amount. 99.7% of all frequency variations will differ from the carrier by less than ± 0.0090 cps. All statistical data are based on one hundred samples.

1-20. MODULAR CONSTRUCTION.

1-21. Solid-state modular construction has been used throughout the 5100A. The modular concept enables the Synthesizer to meet the stringent demands regarding spurious signals since the isolation that it affords minimizes spurious coupling. It also enhances serviceability. Careful design and quality control insure that all modules are interchangeable from one instrument to another.

1-22. INSTRUMENT IDENTIFICATION.

1-23. Hewlett-Packard uses a two-section, eight-digit serial number to identify instruments. The serial number is located on the rear panel of the instrument. The first three digits (serial prefix) identify a series of instruments; the last five digits refer to a specific instrument in that series. If the first three digits of your instrument serial number do not appear on the title page of this manual, there are differences between the manual and your instrument which are described in Appendix I (Serial Prefix 520- and below) or in a change sheet included with the manual. If the change sheet is missing, the information can be supplied by your nearest Hewlett-Packard field or sales office.

1-24. SPECIFICATIONS.

1-25. Table 1-1 lists the technical specifications for the Model 5100A Frequency Synthesizer. Performance data stated in the table are based on the internal frequency standard of the 5110A or indicate Synthesizer contribution to overall performance with an external standard. Stability and spectral purity of the 5100A Frequency Synthesizer will be partially determined by the characteristics of the external standard if used.

1-26. APPLICATIONS.

1-27. The Model 5100A, when driven by the Model 5110A Synthesizer Driver, provides a general purpose source of precisely known, spectrally pure, easily selected frequencies. It can be remotely programmed for use in a variety of automatic measurement systems such as filter or transmission line test sets. It can be used as the local oscillator in secure communications systems where carrier frequencies must be shifted rapidly and often to avoid compromise of confidential communications. The 5100A offers unique advantages for specialized applications in microwave spectroscopy, telemetry, and radar.

SECTION II INSTALLATION

2-1. INITIAL INSPECTION.

2-2. **MECHANICAL CHECK.** If damage to the shipping carton is evident, ask that the carrier's agent be present when the instrument is unpacked. Inspect the instrument for mechanical damage (scratches, dents, broken knobs, etc.). Also check the cushioning material for signs of severe stress.

2-3. **PERFORMANCE CHECK.** The electrical performance of the Model 5100A should be verified as soon as possible after receipt. A performance check that is suitable for incoming inspection is given in Paragraph 5-10.

2-4. **CLAIM FOR DAMAGE.** If the Model 5100A is mechanically damaged or fails to meet specifications on receipt, notify the carrier and the nearest Hewlett-Packard field or sales office immediately. Field and sales offices are listed at the back of this manual. Retain the shipping carton and the padding material for the carrier's inspection. The field or sales office will arrange for the repair or replacement of your instrument without waiting for the claim against the carrier to be settled.

2-5. STORAGE AND SHIPMENT.

2-6. **PACKAGING.** To protect valuable electronic equipment during storage or shipment always use the best packaging methods available. Your Hewlett-Packard field or sales office can provide packing material such as that used for original factory packaging. Contract packaging companies in many cities can provide dependable custom packaging on short notice. Here are two recommended packaging methods:

a. **RUBBERIZED HAIR.** Cover painted surfaces of instrument with protective wrapping paper. Pack instrument securely in strong corrugated container (350 lb/sq in. bursting test) with 2-inch rubberized hair pads placed along all surfaces of the instrument. Insert fillers between pads and container to ensure a snug fit. Mark the box "Delicate Instrument" and seal with strong tape or metal bands.

b. **EXCELSIOR.** Cover painted surfaces of instrument with protective wrapping paper. Pack instrument in strong corrugated container (350 lb/sq in. bursting test) with a layer of excelsior about 6 inches thick packed firmly against all surfaces of the instrument. Mark the box "Delicate Instrument" and seal with strong tape or metal bands.

2-7. RACK INSTALLATION.

2-8. The Model 5100A is ready for bench operation as shipped from the factory. Additional parts necessary for rack mounting are packaged with the instrument. To convert for rack installation, refer to Figure 2-1 and proceed as follows:

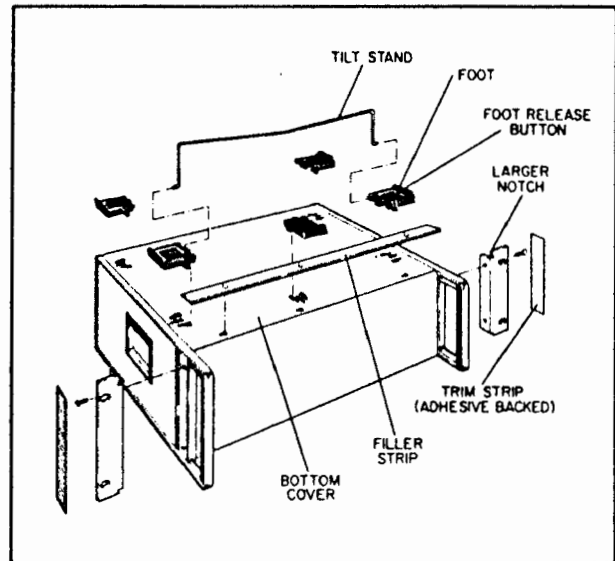


Figure 2-1. Conversion for Rack Mounting

- Remove tilt stand.
- Remove feet (press the foot-release button, slide foot toward center of instrument, and lift off).
- Remove adhesive-backed trim strips at front end of sides.
- Attach filler strip along bottom edge of front panel.
- Attach flanges to front end of sides (larger corner notch toward bottom of instrument). Instrument is now ready to mount in standard rack.

2-9. POWER CONNECTION.

2-10. **LINE VOLTAGE.** The 5100A may be operated from either 115- or 230-volt ($\pm 10\%$) 50 to 400 cps power lines. A slide switch on the rear panel permits quick conversion for operation from either voltage. Insert a narrow-blade screwdriver in the switch slot and slide the switch to the right for 115-volt operation ("115" marking exposed) or to the left for 230-volt operation ("230" marking exposed).

Note

Before connecting ac power to instrument be sure slide switch is properly positioned.

2-11. **POWER CABLE.** The Model 5100A is equipped with a detachable 3-wire power cable. Proceed as follows for installation:

- Connect flat plug (3-socket connector) to ac line jack at rear of instrument.

b. Connect plug (2-blade with round grounding pin) to 3-wire (grounded) power outlet. Exposed portions of instrument are grounded through the round pin of the plug for safety; when only 2-blade outlet is available, use connector adapter (hp part No. 1251-0048), then connect shortwire from side of adapter to ground.

2-12. INSTRUMENT INTERCONNECTION.

2-13. Connect the Model 5110A to the Model 5100A with cable assemblies provided as shown in Figure 2-2. Cables and connectors are marked for proper connection. If output is desired from the front panel OUTPUT connector, connect rear panel HI-LEVEL OUTPUT to the TO FRONT PANEL connector with cable provided. Output may be taken directly from the rear panel output connectors. A joining bracket kit is available for fastening the 5110A and 5100A together. The Part No. is 5060-0216.

CAUTION

The joining bracket kit is not intended to support the weight of either instrument.

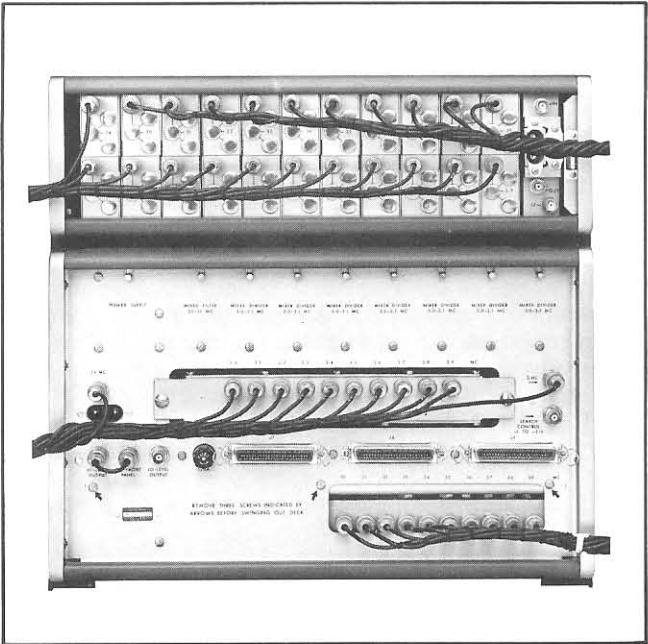


Figure 2-2. 5100A and 5110A
Cable Interconnections

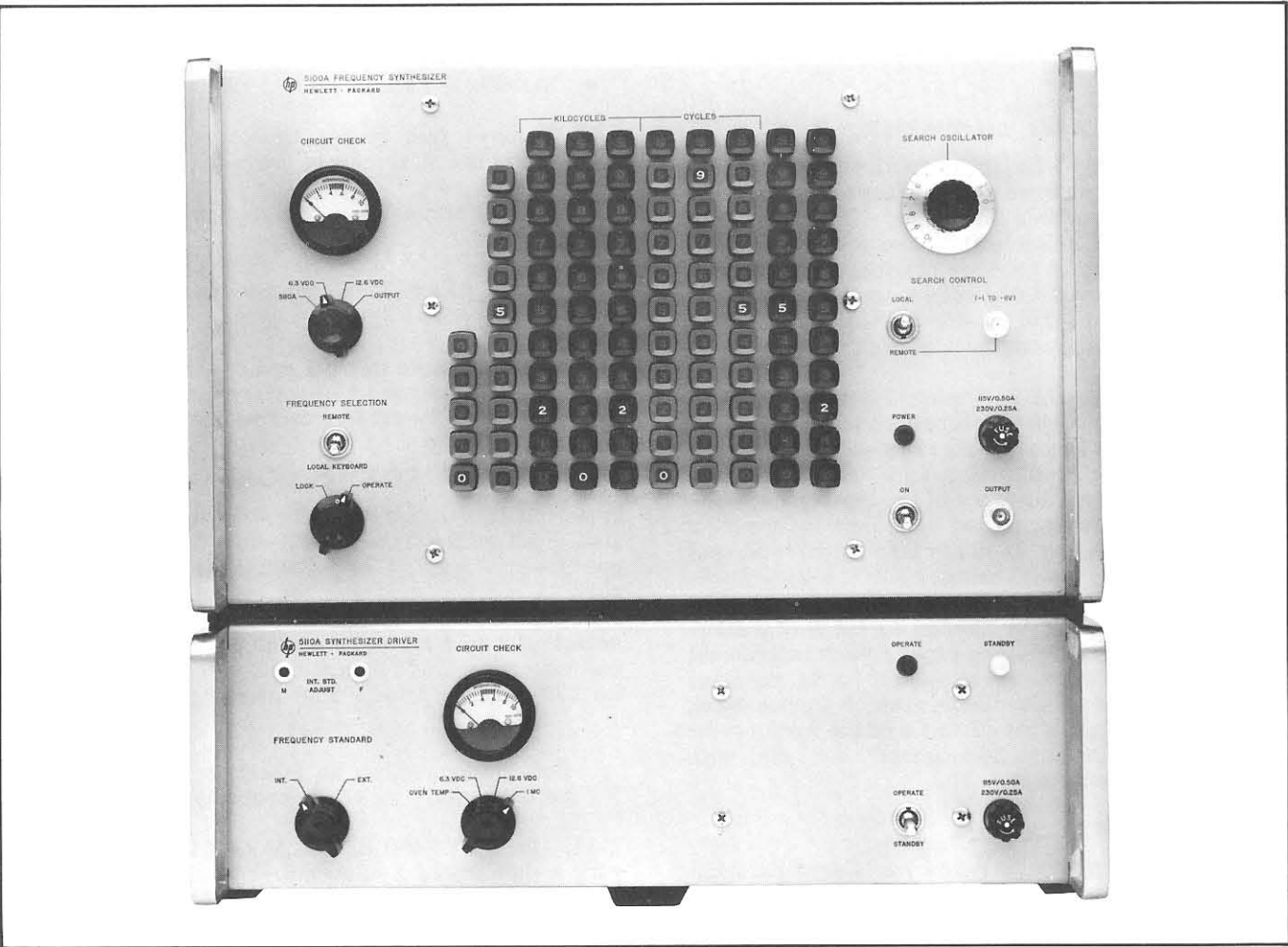


Figure 3-1. Operating Controls, Front View, Model 5100A/5110A

SECTION III OPERATION

3-1. INTRODUCTION.

3-2. This section tells how to operate the 5110A/5100A. This is done by describing a turn on, circuit check procedure for the two instruments making up the system. A front panel view of the system is shown in Figure 3-1. The twenty-two rear panel cable connections must be made between the 5110A and the 5100A prior to turning them on as a system. See Paragraph 2-13.

3-3. OPERATION - 5110A.

3-4. TURN-ON. Plug the power cord into the line. With the OPERATE-STANDBY switch in the STANDBY position, the STANDBY light should light. Put the OPERATE-STANDBY switch in the OPERATE position. The OPERATE light should light.

Note

The oscillator oven is on anytime that the 5110A power cord is connected to the line.

3-5. CIRCUIT CHECK switch.

a. OVEN TEMP. In this position, a reading in the green section of CIRCUIT CHECK meter indicates that the oven has reached its proper operating temperature.

b. 6.3 VDC AND 12.6 VDC. Both of these positions must give a reading in the green section of CIRCUIT CHECK meter. This indicates the power supply of the 5110A is operating properly.

c. 1 MC. A reading in the green section of the CIRCUIT CHECK meter indicates that the 1-Mc signal is present and has the proper amplitude.

3-6. FREQUENCY STANDARD switch. This switch allows use of either the oscillator within the 5110A or an external oscillator.

3-7. OPERATION - 5100A.

3-8. TURN-ON. Plug the power cord into the line and set POWER switch to ON. The POWER light should light.

3-9. CIRCUIT CHECK switch.

a. 5110A. A reading in the green section of the CIRCUIT CHECK meter indicates that the 3-Mc signal from the 5110A is present.

b. 6.3 VDC AND 12.6 VDC. Both of these positions must give a reading in the green section of the CIRCUIT CHECK meter. This indicates the power supply of the 5100A is operating properly.

c. OUTPUT. A reading in the green section of the CIRCUIT CHECK meter indicates that a synthesized signal of proper amplitude is present.

CAUTION

Do not connect cable which contains a DC level to the OUTPUT jack.

3-10. FREQUENCY SELECTION switch. In the LOCAL mode of operation the switch is set to the LOCAL KEYBOARD position. When using the 5100A from a remote position, the switch is set to the REMOTE position.

3-11. LOCK-OPERATE selector. To operate the pushbuttons this switch is placed in the OPERATE position. After frequency is selected the switch may be set to the LOCK position. This prevents an accidental frequency change.

3-12. THE PUSHBUTTONS. With these pushbuttons it is possible to select five billion discrete frequencies. A button must be depressed in each column for an output signal to be present.

3-13. THE SEARCH OSCILLATOR. The output frequency of the search oscillator is controlled by varying the dc voltage to it. Turning the SEARCH OSCILLATOR dial varies the dc voltage to the search oscillator and thus varies its output frequency. The signal from the search oscillator is injected into the decade module corresponding to the column in which the "S" button is depressed. To use the SEARCH OSCILLATOR dial, the SEARCH CONTROL LOCAL-REMOTE switch must be in the LOCAL position.

3-14. If the SEARCH CONTROL-REMOTE switch is in the REMOTE position, the output of the search oscillator may be controlled by applying a dc voltage to the BNC connector labelled (-1 to -11V).

3-15. REMOTE PROGRAMMING.

3-16. Any frequency or search oscillator position that can be selected by front panel pushbuttons on the Synthesizer may be selected remotely.

3-17. Three 50-pin connectors are located on the 5100A rear panel which collectively provide one pin corresponding to each of the pushbutton positions on the front panel (see Figure 3-2). Each connector also supplies a ground connection and a -12.6 volt line from the internal power supply which may be used in remote switching. This voltage is only present when the front panel LOCAL-REMOTE switch is in the REMOTE position. An "un-switched" -12.6 volts is also available at each connector. When the switch is in the LOCAL position, voltages appear at the remote programming connectors, as shown in Table 3-1.

3-18. When switched to REMOTE, the Synthesizer pushbuttons are completely disconnected and all remote programming leads assume the "OFF" voltages. It is then necessary that a digit or "S" position be remotely selected for each column.

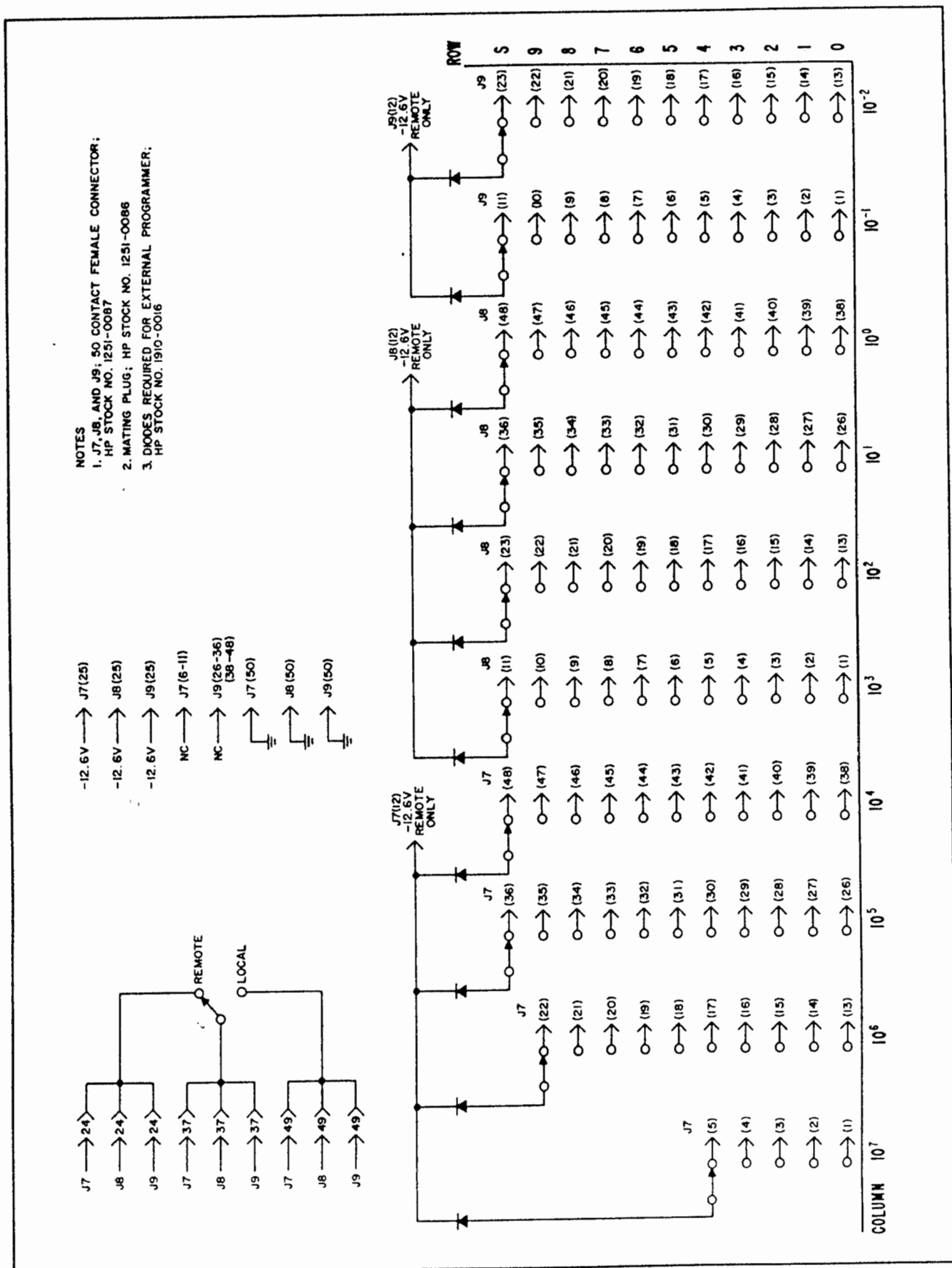


Figure 3-2. Remote Control Pin Connections of J7, J8, and J9

SECTION IV

THEORY OF OPERATION

4-1. INTRODUCTION.

4-2. The output frequencies from the Frequency Synthesizer are all derived from a single precise standard signal by the electronic performance of the operations of addition, subtraction, multiplication, and division. In order to accomplish the arithmetic operations, the Synthesizer uses mixers, dividers, and multipliers. These devices generate certain unwanted signals which tend to degrade the desired signal. For the output signal to retain the same cleanliness as the standard, some rather sophisticated design techniques have been used in the system. Considerable attention has been given to shielding and termination.

4-3. The Frequency Synthesizer consists of two modular cabinets: the 5100A Frequency Synthesizer and the 5100A Synthesizer Driver; the basic arrangement is shown in Figure 4-1.

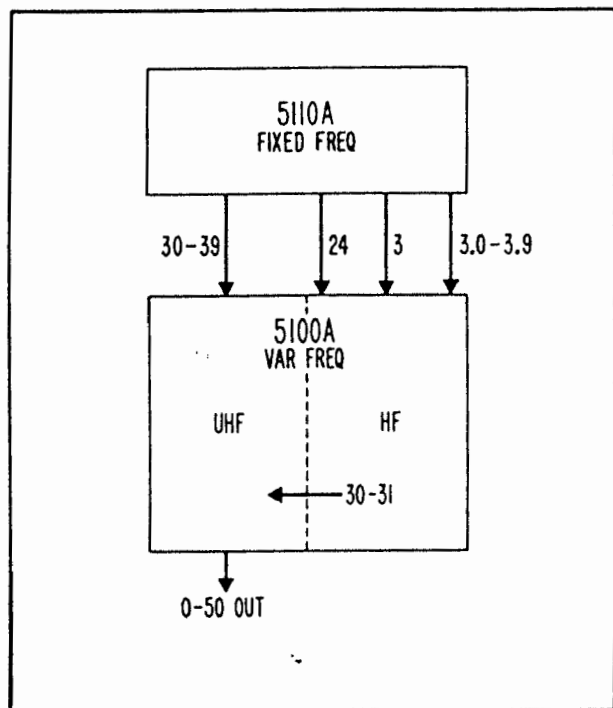


Figure 4-1. 5100A/5110A Synthesizer System Block Diagram

4-4. The 5100A Frequency Synthesizer provides the means to combine, by direct synthesis, the signals provided by the 5110A Synthesizer Driver. As shown in Figure 4-1, the 5100A is divided into an HF section and a UHF section. Figure 4-3 depicts the block diagram of the HF section. This section utilizes the 24 Mc, 3 Mc, and the 3.0 through 3.9 Mc signals from the 5110A. The latter 10 signals are fed into a diode switch matrix which is controlled by dc voltages provided either by means of front panel pushbutton control or by remote programming jacks on rear panel of the 5100A.

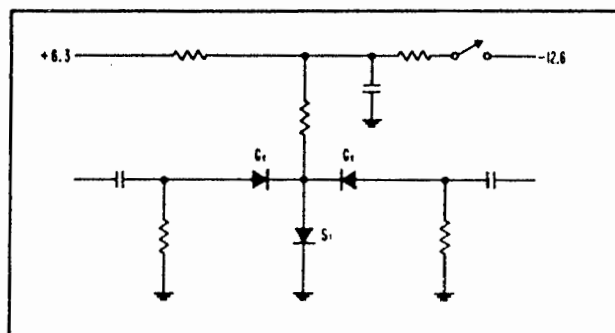


Figure 4-2. 3 to 4 Mc Diode Switch Schematic

4-5. The Diode Switch matrix enables rapid frequency selection. Figure 4-2 shows the basic circuit of the switch used in this 3 to 4 Mc matrix. In normal (open) position, a positive 6.3 vdc is applied through a resistive network to the anode of the silicon diode. The voltage drop across the conducting diode is sufficient to hold the two germanium diodes cut off. When this switch is chosen by means of remote contact closure or manual pushbutton, a negative 12.6 vdc is applied (see Figure 4-2). This causes the silicon diode to be reverse-biased. The switch will now allow the desired signal to be passed through it. These switches are embedded in blocks to achieve minimum coupling from one section of the switch to the other. The 3 to 4 Mc switch assembly contains 11 boards, one for each digit 0 through 9 and one for the "S" (search) position. Each board contains 8 diode switches of the type previously discussed. Each switch corresponds to a significant column of the selected frequency. The significant columns that control this 3 to 4 Mc matrix are 10^{-2} (0.01 cps steps) through 10^5 (100 kc steps). The limitations on switching speed are the time constants in the filtering circuits on the supply line to switch and circuit bandwidths.

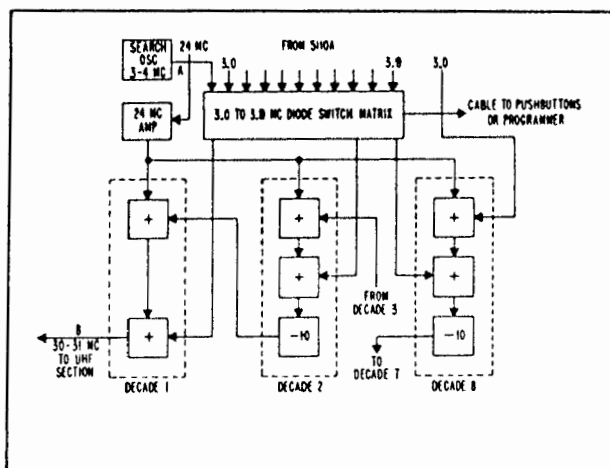


Figure 4-3. 5100A HF Section

Table 3-1. ON-OFF Switch Voltages

Column	"ON" DIGIT	"OFF" DIGIT
10 ⁷	-12.6 vdc	+6.3 vdc
10 ⁶	-12.6 vdc	+1.5 vdc
10 ⁵ thru 10 ⁻²	-12.6 vdc	+1.5 vdc

3-19. An actual contact closure such as a relay is not required for remote programming the Synthesizer. The connection, the application of -12.6 vdc to the selected pin, may be made electronically through a transistor.

3-20. Figure 3-3 shows the basic circuit of the type of switch used in the 3 to 4 Mc matrix. In the normal (open) position, a positive 6.3 volts is applied through a resistive network to the anode of the silicon diode. The voltage drop across the conducting diode is sufficient to hold the two germanium diodes cut off. When this particular switch is chosen by means of remote control or manual pushbutton, a negative 12.6 volts is applied as shown in Figure 3-3. This operation will cause the silicon diode to be reverse-biased. Consequently, the switch will now allow the desired signal to be passed through it. These switches are embedded in blocks to achieve minimum coupling from one section of the switch to the other. When the switch is off, attenuation is better than 110 db.

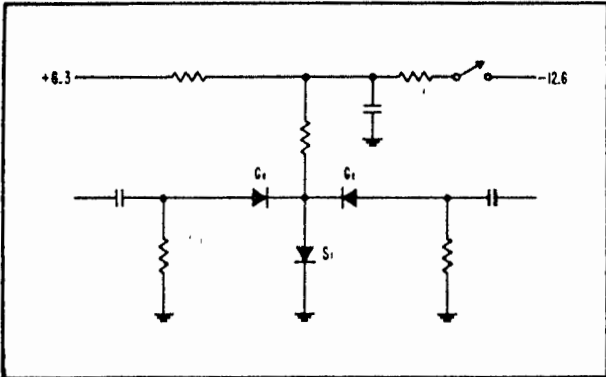


Figure 3-3. Diode Switch Schematic

3-21. When another digit in this particular column is selected, this switch must be turned off, and the one corresponding to the newly selected digit must be turned on. In order to turn this type of diode switch off, the -12.6 volts must be removed, and the common node of the diodes must be allowed to rise above the forward positive potential of the silicon diode. If the impedance presented by the programmer circuit in the OFF position is not an effective open circuit, there is no assurance that this potential will be reached. Consequently, in the OFF position, the programming circuit should present an impedance of at least 100 K ohms to the Synthesizer. Figure 3-4 shows a circuit which has been used successfully in remote programming. The switch mechanism is a transistor connected to the -12.6 volt line which is saturated in the ON condition and open in the OFF condition. This method meets the established criterion since the off transistor presents a virtual open circuit to the Synthesizer.

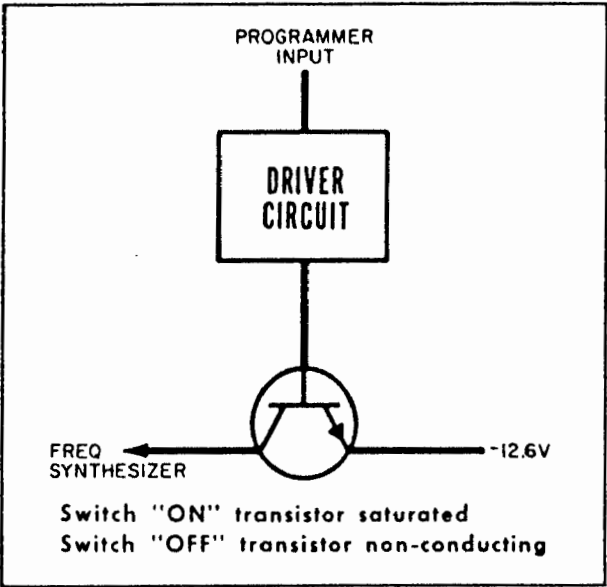


Figure 3-4. Remote Programming Driving Circuit

3-22. It is advisable to use diodes in the programming scheme as indicated in Figure 3-2 to avoid duplicate selection when the Synthesizer is being used in the LOCAL mode while remote programming circuitry is connected.

3-23. Current requirements for remote programming are shown in Table 3-2.

Table 3-2. Remote Current Requirements

Column 10 ⁷	16 ma
Column 10 ⁶	14 ma
Columns 10 ⁵ thru 10 ⁻²	8 ma per column

3-24. Because internal circuits are susceptible to low frequency ripple on the power supply line (e.g., 60 cycles and 120 cycles), stringent requirements have been placed on the power supply. In order to ensure that ripple-induced spurious signals will be 90 db down it is necessary that low frequency ripple present on the supplies be less than 10 microvolts. When the internal supply is used externally for remote programming, the maximum allowable low frequency current that can be injected into the internal supply is 200 microamperes or, considering 10 columns are being programmed, 20 microamperes per column. This restriction does not hold if an external -12.6 volt supply is used. When this method is employed, the -12.6 volts may have up to 1 millivolt ripple.

3-25. A combination of local and remote programming may be accomplished with the LOCAL-REMOTE switch in the LOCAL position and with no pushbuttons depressed in the columns to be remotely programmed. While operating the Synthesizer in its LOCAL mode, the voltages appearing on the remote programming connectors may prove useful for remote indications.

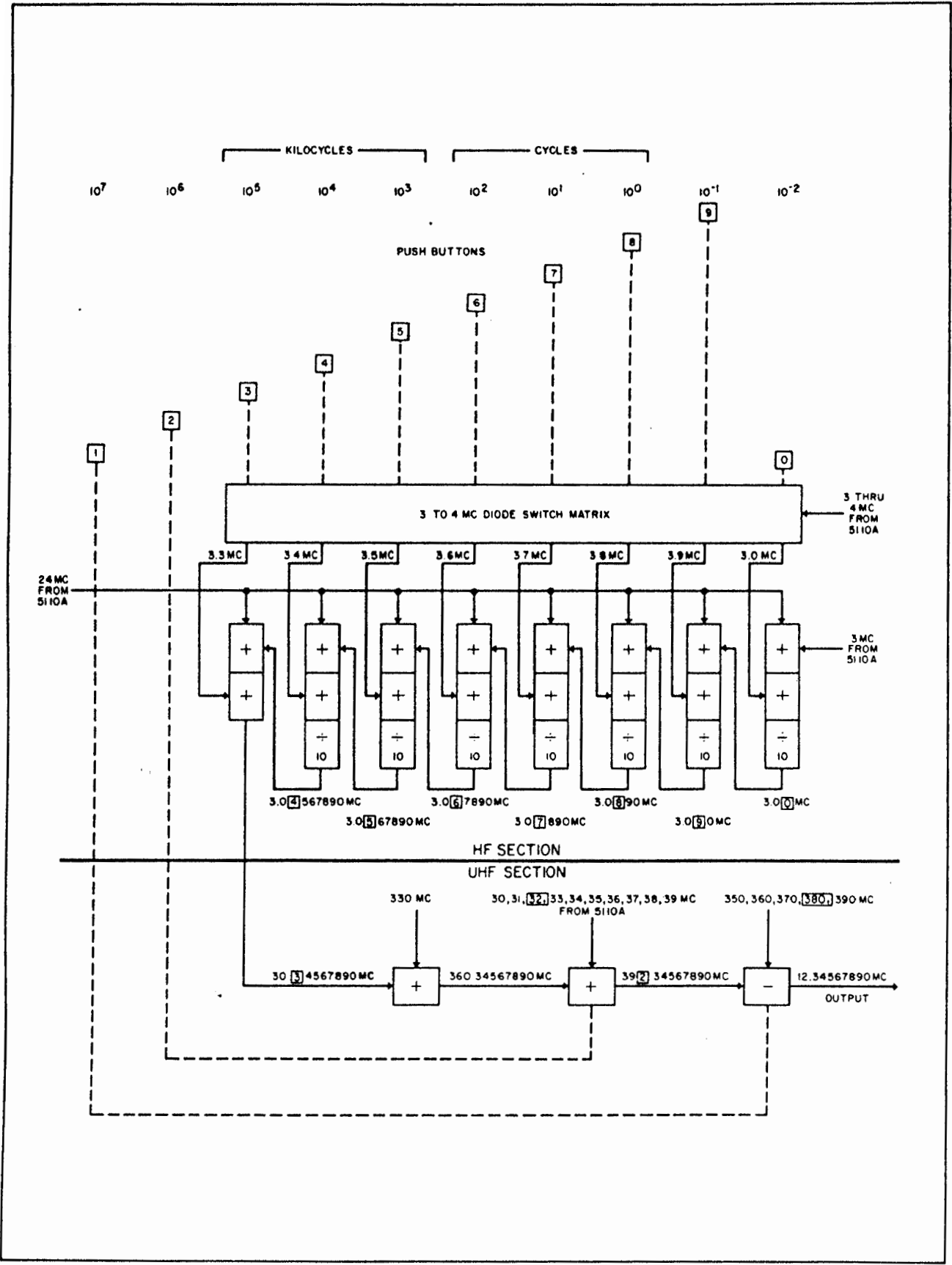


Figure 4-4. Synthesizer Block Diagram

4-6. Note that there are eight separate outputs from the switch assembly, each of which may be individually selected between 3.0 and 3.9 Mc. Seven outputs are connected to mixer/divider modules. The first seven modules (those controlled by the columns 10^{-2} through 10^4) are composed of two balanced mixers and one decade divider. The eighth module is similar to the first seven except that it lacks the divider. Here, again, the problems of noise and spurious responses arise. Spurious signals are generated by intermodulation products in the mixers, so the first thought is to reduce signal level. On the other hand, a relatively high signal level is required to maintain a respectable signal-to-noise level. The optimum compromise between spurious performance and signal-to-noise ratio is achieved in the HF section's modules.

4-7. The HF section of the 5100A produces a signal between 30 and 31 Mc having 8 synthesized digits. Figure 4-3 shows the basic module arrangement. An example explaining the operation of these modules, and by extension, the operation of the HF section in general, follows (Figure 4-4 applies directly to this example). The pushbuttons are shown for a selected frequency of 12,345,678.90 cps. The digit 0 is selected in the least significant column (10^{-2}). 24 Mc and 3 Mc from the 5100A are added in the first mixer of the selected module. The resultant 27-Mc signal is then added to a selected 3.0-Mc signal in the second mixer. Had we selected the digit 2 in the 10^2 column, 3.2 Mc would have been added to 27 Mc in the second mixer. In the original example, the addition of 27 Mc and 3.0 Mc signal results in 30.0 Mc. This synthesized signal is divided by 10 to give 3.00 Mc. (A great deal of filtering is carried on between successive operations in this module to minimize spurious signals). The resultant signal is now fed to the 2nd module and added to 24 Mc to obtain 27.00 Mc. If the pushbutton column controlling this second module (10^{-1}) is now set to digit 9 as shown, 3.9 Mc from the switch matrix is added to 27.00 Mc in the second mixer to get 30.90 Mc. This signal is now divided by 10 to 3.090 Mc. Figure 4-4 shows the digit 8 selected in the 10^0 column. The 3rd module first adds the synthesized 3.090 Mc from the output of the 2nd module to 24 Mc to get 27.090 Mc. 3.8 Mc is added to this to get 30.890 Mc. This is divided by 10 to get 3.0890 Mc.

4-8. The basic operation of the 5100A high frequency section now becomes clear; we successively add digits starting with the least significant and then divide by ten. When we have gone through the seven least significant columns (10^{-2} through 10^4), the result is a synthesized signal of 3.04567890 Mc. In the eighth module (10^5) this signal is again added to 24 Mc and the selected 3.3 Mc signal. However, since there is no divider in this module, it provides an output of 30.34567890 Mc. Each module receives 24 Mc from the 5110A. The least significant module always adds 3 Mc before its selected 3.0 through 3.9 Mc is added. All modules after the least significant one utilize the synthesized frequency of the previous module in place of the fixed 3-Mc signal. The output of the HF section of the 5100A will always be between 30 Mc and 31 Mc.

4-9. Each of the eight least significant columns has an "S" pushbutton. If this position is selected in any

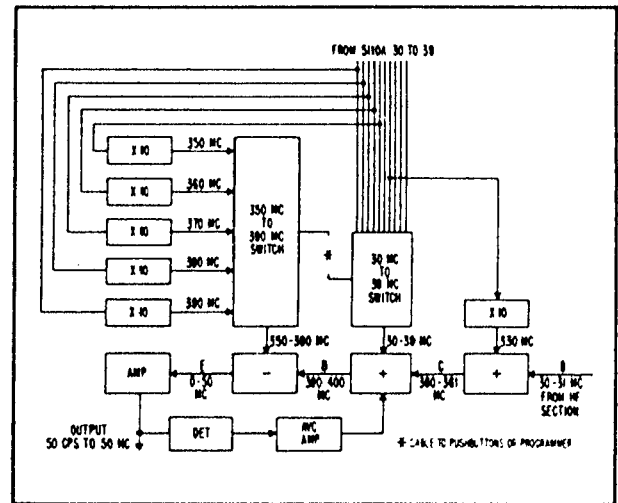


Figure 4-5. Model 5100A UHF Section

of these columns, a 3- to 4-Mc search oscillator is substituted for the 3.0 through 3.9-Mc signals from the 5110A to the selected module. This enables manual or continuous scanning of the selected digit position. For example, if an unknown signal is mixed with the Synthesizer output, the search oscillator may be used to obtain a pre-determined beat note. When this beat note is obtained for the most significant column, the correct digit pushbutton may be substituted for the search position in that column. The same procedure may then be followed for the next most significant column. Since the search oscillator is voltage controllable, it provides a sweep oscillator capability for the Synthesizer with extremely well-defined end points -- the digit buttons in the columns to the left and right of the searched column.

4-10. These basic blocks -- the diode switch matrix, the eight mixer modules, and the search oscillator -- comprise the high frequency section of the 5100A. They function to provide a selected frequency between 30 Mc and 31 Mc, having the stability of the internal standard, or a 1 Mc or 5 Mc external standard.

4-11. The 5100 UHF section adds the 1 megacycle and 10 megacycle steps. Now that a very accurate signal between 30 and 31 Mc is generated, the next step is to translate this accuracy to a signal between 0 and 50 Mc. This function is performed by the UHF section of the 5100A. Figure 4-5 shows the basic blocks involved in this operation. The 33-Mc signal generated by the 5110A is fed to a harmonic generator and multiplied by 10 to 330 Mc. This signal is mixed with the signal generated in the HF section to obtain a signal between 360 and 361 Mc. In the example, this would be 360.34567890 Mc at this point. This signal is filtered and then mixed with one of ten selected frequencies (30, 31, 32,, 39 Mc) to obtain a frequency in the range of 390 to 400 Mc. This 30- to 39-Mc switch employs much the same basic circuit and DC switching arrangement as that found in the 3- to 4-Mc matrix. The particular frequency selected in this operation is dependent on the particular digit chosen in the 10^6 column. In the example, 32 Mc would be chosen and would give 392.34567890 Mc. A

frequency has been generated which is selectable in 1-Mc steps and which still retains the original 0.01 cps resolution. To add the last or most significant digit, the 35, 36, 37, 38, and 39 Mc signals from the 5110A are individually multiplied by ten. The selected frequency which is determined by the digit selected in the 10^7 column is then mixed with the synthesized signal. The resulting difference frequency is variable through 50 Mc and is the final synthesized frequency. In the example, the 380-Mc signal would be chosen. This, when subtracted from 392,345,678.90 cps, gives the final output of 12,345,678.90 cps. A few points are worth emphasizing. All the information leaving the HF section of the 5100A is contained in a band between 30 and 31 Mc, well within the capabilities of the filters used, which effectively remove spurious intermodulation responses which arise in mixing. The first two mixers in the UHF section are parametric. This gives a desirable low noise level.

4-12. The following paragraphs discuss the principles of operation of the individual assemblies and modules used in the Frequency Synthesizer in the order of their assembly or module identification.

4-13. PUSHBUTTON SWITCH A1.

(Schematic Diagram: Figure 5-13)

4-14. A positive 6.3 volts and a negative -12.6 volts is brought to this assembly from the Power Supply A25. The 6.3 volts is connected by P20 and P21 to J20 and J21 of the 3 to 4 Mc Diode Switch A3, and by P19 and P18 to J19 of the 30 to 39 Mc Diode Switch A19 and J18 of the 350 to 390 Mc Diode Switch A20. The -12.6 volts is connected to the proper diode switch or multiplier depending on which frequency is selected by the pushbuttons.

4-15. For example, if a frequency such as 37,000,000 Mc is selected, the individual pushbuttons perform the following functions:

a. The "3" pushbutton connects -12.6 volts to multiplier A16, turning it on, and to the 350 to 390 Mc switch module A20, closing the 380 Mc Switch.

b. The "7" pushbutton connects -12.6 volts to the 30 to 39 Mc Switch Module A19, closing the 37 Mc switch.

c. The "S" pushbutton connects -12.6 volts to the 3 to 4 Mc Switch A3, closing the Search Oscillator switch.

d. The "0" pushbuttons in the remaining columns connect -12.6 volts to the 3 to 4 Mc switch A3, closing the 3 Mc switches.

4-16. The pushbutton switch assembly provides 103 contact closures, one for each pushbutton on the front panel. Punching a pushbutton in any given column closes a contact and applies a -12.6 volts to the appropriate diode switch in the 3 to 4 Mc switch A3, 30 to 39 Mc switch A19, 350 to 390 Mc switch A20, to appropriate multiplier A13 through A17, and to connections on the remote control jacks J7, J8, and J9 on the rear panel.

4-17. SEARCH OSCILLATOR A2.

(Schematic Diagram: Figure 5-14)

4-18. The Search Oscillator is a Colpitts Oscillator (A1Q1, A1C1, A1C2, A1L1, A1CR5, and A1CR6) operating between 3 Mc and 4 Mc. The oscillator frequency is controlled by the voltage at the junction of varactors A1CR5 and A1CR6. The varactor response is not linear with voltage, so compensating network A1CR1-A1CR4. A1R1-A1R4 precedes the varactor junction to provide the proper control voltages. The control voltage is adjusted by front-panel SEARCH OSCILLATOR control A2R1 when S4 is set to LOCAL, and by an externally supplied -1 to -11 volts at J11 when S4 is set to REMOTE.

4-19. Isolation between the Oscillator A1Q1 and amplifier A1Q2 is increased by A1R9, which also flattens the amplifier frequency response. Voltage divider A2R2, A2R3, and A1R16 provides back-biasing to A1CR6. The effects of temperature changes on the varactors are compensated by A2CR1. Current through A2CR1 is limited by A2R1. The Search Oscillator output amplitude is adjusted by A2R4. The output signal is filtered by low-pass filter A2L1, A2L4, A2L2, A2C3, A2C4, and A2C5; the filter has a high frequency limit of 4 Mc. Ac grounds for A1Q1 base and A1CR6 cathode are provided by A1C8 and A1C3 respectively. Filtering of the -12.6 and +6.3-volt supplies is provided by L1, C2, C3, L2, C4, C1 and L3.

4-20. 3 TO 4 MC SWITCH A3.

(Schematic Diagram: Figure 5-15)

4-21. The 3 to 4 Mc Switch Module has within it 11 switch board assemblies, each of which has eight diode switches. The signals (3.0 through 3.9 Mc) from the filter dividers and the output of the Search Oscillator (3.0 to 4.0 Mc) are brought to separate inputs on the 3 to 4 Mc Switch Module.

4-22. The output from the Search Oscillator is brought to A3J9. A3J9 is connected to emitter follower A3A1Q1 which serves as a buffer between 10^5 and 10^4 diode switches and the remaining diode switches. The diode switch CR1, CR2, CR3, and CR4 is controlled by the "S" button in the 10^5 column. If the "S" button in this column is not pushed, +6.3 volts back-biases CR1, CR2, and CR3 and permits no signal flow through CR1, CR2, and CR3. Any small signal that might appear at the junction of CR2 and CR3 is routed through CR4 to ground. When the "S" button is pushed in this column, -12.6 volts is applied at R2 and R4. This voltage forward-biases CR1, CR2, CR3 and back-biases CR4. Thus any signal at C1 passes through CR1, CR2, and CR3 to J1. Operation of the other diode switches is identical.

4-23. CONNECTOR BLOCK A4.

(Schematic Diagram, Figure-16)

4-24. The Connector Block is the source of power and signals for Mixer/Dividers A5 through A11 and Mixer/Filter A12. 24 Mc and 3 Mc signals from the 5110A are brought to the Connector Block and are connected to the Mixer/Dividers and Mixer/Filter.

4-25. The 3 Mc signal from the 5110A is amplified by A4A1Q1 and A4A1Q2 and connected to Meter M1 for front panel monitoring. Part of the 3 Mc signal is tapped off between A4A1R1 and A4A1R2 and connected to input of Mixer/Divider A5. The 24 Mc signal is supplied to Mixer/Filter A12 and through A4A4Q1 to Mixer/Filter A5 through A10.

4-26. MIXER/DIVIDERS A5 THROUGH A11.

(Schematic Diagram, Figure 5-17)

4-27. A 24 Mc signal is connected to pin 6 of P1 and amplified by Q1 and Q2. A 3.0 to 3.1 Mc signal is connected to pin 2 of P1, goes through low pass filter L36, C48, L37, and C49 and then to T1. The 24 Mc and 3.0 to 3.1 Mc signals are mixed in a balanced mixer network, T1, CR1, CR2, C16, and C17. The resultant 27 to 27.1 Mc signal goes through a band pass filter, C18, C19, L12, C20, L13, C21, and C22, and is amplified by Q3. 3 to 4 Mc from the 3 to 4 Mc Diode Switch or from the Search Oscillator is connected to pin 1 of P1 which is connected to Q6. Emitter follower Q6 provides a high impedance input for this signal. This signal then passes through low pass filter L20, C34, L21, and C35, and on to T2. The 27 to 27.1 Mc and the 3 to 4 Mc signals are mixed in balanced mixer T2, C36, CR3, CR4, and C37. The resultant 30 to 31 Mc signal is connected to divider A2.

4-28. The signal then goes through bandpass filter C61, C62, L61, C63, R51, L62, C64, and C65, and is amplified by Q51. The 30 to 31 Mc signal passes through a band-pass filter and is amplified by Q52 and Q53. CR51 selects only the negative peaks of the signal and presents them to the base of Q54 and L68. L68 is tuned to provide the proper amount of current leak-off so that Q54 will function as a stored-charge divide-by-two amplifier. R65 and C79 is a self-biasing circuit which makes Q54 operate in the range of L68.

4-29. Divider action begins when the first negative half-cycle of sine-wave appears at the cathode of CR51 causing that diode to conduct. Current flows through T52 secondary, CR51, R62, Q54 base-emitter junction, C79 and R65, turning on the transistor, causing minority carrier storage in the base-emitter junction, and charging C79 to provide a bias voltage for Q54 emitter. Current through L68 increases exponentially from zero until the diode shuts off at the end of the negative half-cycle, when the input signal goes positive.

4-30. When the input signal goes positive, diode CR51 shuts off. Current through the coil decreases exponentially, drawing off the minority carriers (charges) stored in Q54 base-emitter junction. The time constants of the divider circuit are such that the charges in the base-emitter junction are not exhausted and the transistor remains turned on, so no change is made in the collector circuit or voltage.

4-31. During the second negative half-cycle, more of the input signal current is required to sustain the current through L68, since L68 current now increases exponentially from a value greater than zero. Because Q54 emitter is already negatively biased due to the charge on C79, and current required for the coil is increased, fewer charges are stored in the Q54 base-

emitter junction as a result of the second negative half-cycle.

4-32. When the input signal again goes positive, diode CR51 shuts-off. Current through L68 decreases exponentially, drawing off the charges in the transistor base-emitter junction. This time the coil current is greater than it was during the first positive half-cycle of input signal, while the amount of charge in the transistor base-emitter junction is less, so the coil conducts until the supply of charges is exhausted. This takes less than one half-cycle of the input signal. Since there are no charges in the base-emitter junction, the transistor shuts off. The charge on C79 leaks off through R65.

4-33. The third negative half-cycle of input signal sees the same conditions as the first half-cycle. There is no coil current, and the transistor is not conducting. Thus the transistor is turned on and off once (15.0 to 15.5 Mc) for each two cycles of the input signal (30.0 to 31.0 Mc).

4-34. The output of the stored-charge divider drives a regenerative divide-by-five divider consisting of Q55 acting as class C amplifier driving a tank circuit tuned to the desired output frequency (3.0 to 3.1 Mc). The transistor is initially not conducting and is turned on by a negative-going signal from the stored-charge divider, starting oscillations in the tank circuit. The signal from the tank circuit is fed to a low pass filter C84, L71, C85, L72, and C86 to the output at pin 3 of P1.

4-35. A portion of the signal in the tank circuit of Q55 is fed to Q55 emitter from the voltage divider C80 and C81. The non-linear characteristic of the transistor-base-emitter junction causes the fourth harmonic of the output frequency to be generated there and mixed with the input signal from the stored-charge divider to produce the desired output signal (3.0 to 3.1 Mc) at Q55 collector.

4-36. Diodes CR54, CR55, and CR56 in series between Q55 emitter and ground prevent the transistor base-emitter junction from breaking down and causing noise when the transistor is reverse-biased. The diodes conduct first, and once conducting, the voltage across the base-emitter junction will never be sufficient to cause it to break down. Diodes CR52 and CR53 provide clamping to limit the regenerative divider output signal to voltages between ground and +6.3 volts.

4-37. MIXER/FILTER A12.

(Schematic Diagram: Figure 5-18)

4-38. Mixer A12A1 operation is identical to that described in Paragraph 4-27. Filter A12A2 operation is similar to that described in Paragraph 4-28, except that the 30 to 31 Mc signal is not divided by ten.

4-39. 39 TO 390 MC MULTIPLIER A13.

(Schematic Diagram: Figure 5-19)

4-40. The function of Multiplier A13 is to multiply the 39 Mc signal to 390 Mc. 39 Mc from the 5110A

is connected to A13J1 where it sees an impedance of approximately 100 ohms. The signal is amplified by Q1 and appears on the collector of Q1 and sees a hi-Q circuit A1C5 and A1L2. This circuit removes any undesirable 1 Mc sidebands. A1C6 and A1R6 look like a transformer and couple the signal to A1Q2 where it is again amplified and appears across tuned transformer A1T1. The signal on the secondary is connected to frequency doubler A1CR1-CR4. Note the dc path from the junction of A1CR1-CR2 through A1R11 to A1Q5. The path continues through A1Q5 to ground if the "0" pushbutton in the most significant column is pushed applying -12.6 volts to its base turning it on. If the "0" pushbutton is not pushed there is no output from this module. Assuming the pushbutton is pushed a 78-Mc signal appears at the junction of A1CR3-CR4. The signal sees a tuned transformer of about 500 ohms and is coupled through A1C20 to grounded base amplifier A1Q3. A1C21 cancels out reactance of A1Q3. The signal on the collector of A1Q3 sees what looks like a transformer, A1C22 and A1R16. A1L8 tunes out reactance of A1C22. A1R14 suppresses oscillations of A1CR5. A1R15 controls the gain of A1Q3. A1C24-25 are tuned for maximum 390 Mc output. A1R17, Q4, and CR6 are a degenerative feedback loop which stabilizes the output. A1CR5 is a step-recovery diode used as a harmonic generator. The fifth harmonic from A1CR5 is the desired output from the multiplier.

4-41. MULTIPLIERS A14-A17.

(Schematic Diagrams: Figures 5-20 thru 5-23).

4-42. The operation of these multipliers is similar to that of A13 except that these multipliers have no power supplied to them unless the "1", "2", "3" or "4" button in the most significant column (column of pushbuttons farthest left) is pushed. For example, pushing the "1" button applies -12.6 volts to the base of A14A1Q5, turning it on. When A14A1Q5 turns on its collector goes positive turning on A14A1Q6 which now allows the -12.6 volts at its emitter to be conducted to the rest of the multiplier circuits, activating them.

4-43. 33 TO 330 MC MULTIPLIER A18.

(Schematic Diagram: Figure 5-24).

4-44. The operation of this multiplier is similar to the others except that the circuits in this module are always on.

4-45. 30 TO 39 MC SWITCH A19.

(Schematic Diagram: Figure 5-25)

4-46. The operation of this diode switch is similar to that described in Paragraph 4-22. Note CR4 and CR5 which provide additional isolation between "on" and "off" conditions of the switch. This module is the source of all input frequencies for the multipliers. A11Q1 serves as an impedance transformer and part of its gain as an amplifier offsets the insertion loss in the diode switches.

4-47. 350 TO 390 MC SWITCH A20.

(Schematic Diagram: Figure 5-25)

4-48. The operation of this diode switch is similar to that of the other diode switches. The frequencies

present at the input are not permitted to pass through unless the appropriate front panel pushbutton is pushed.

4-49. 1ST UHF MIXER A21.

(Schematic Diagram: Figure 5-26)

4-50. The function of the 1st UHF Mixer is to take the 330 Mc and 30 to 31 Mc signals, mix them, select a resultant signal which lies between 360 and 361 Mc, amplify it and apply it to Filter FL7.

4-51. 330 Mc from Multiplier A18 is connected to J2 and from here to primary of T1. C1 tunes T1's secondary for maximum transfer of 330 Mc signal. The synthesized 30 to 31 Mc signal from Mixer/Filter A12 is connected to J1. The signal is fed to a filter consisting of a series resonant circuit followed by a pi network. C2 and C7 are adjusted to give equal response to band endpoints 30 and 31 Mc. R3 adjusts the bias on mixer diode CR2. The 330 Mc signal on the secondary of T1 and the synthesized 30 to 31 Mc signal are heterodyned in CR1 and CR2 and the resultant products are coupled to the primary of T2. C4 tunes the primary to select a 360 to 361 Mc signal which is coupled to common base amplifier Q1. C6 is tuned for maximum and also for equal amplitude at band edges. T3 is an impedance matching transformer.

4-52. 2ND UHF MIXER A22.

(Schematic Diagram: Figure 5-27)

4-53. The 2nd UHF Mixer operates in a manner similar to the 1st UHF Mixer with the following differences. Due to the broader band of frequencies that must be handled in the 2nd UHF Mixer, more amplification is necessary to provide the proper level of output signal. Amplifier A1Q1 provides initial amplification of the selected 30 to 39 Mc signal. L3 and L5 are adjusted to provide equal response at the filter band limits, 30 and 39 Mcs. Following the heterodyning of the 360 to 361 Mc and the 30 to 39 Mc signals in CR1 and CR2 are amplifiers A2Q1 and A2Q2. C4, C6, and C9 are tuned to provide equal response over the 390 to 400 Mc band.

4-54. Also connected to the input of amplifier A2Q2 is an automatic gain control line from the output amplifier A24. If the signal in the output amplifier increases, the action is such that the current to amplifier A2Q2 decreases, thereby lowering the gain of A2Q2.

4-55. 3RD UHF MIXER A23.

(Schematic Diagram: Figure 5-28)

4-56. Final mixing in the Synthesizer occurs in the 3rd UHF Mixer. Both input signals have been synthesized and are mixed in CR1 and CR2. R1, R2, and R3 form a 3 db pad for the 390 to 400 Mc signal. R4, R5, and R6 form a 2 db pad for the 350 to 390 Mc signal. DL1 is a 180° phase line. The frequencies lying between 0 and 50 Mc from CR1 and CR2 see an easy path through the lo-pass filter and on to J3. The other frequencies are either bypassed to ground or rejected by inductances.

4-57. OUTPUT AMPLIFIER A24.

(Schematic Diagram: Figure 5-29)

4-58. The function of the output amplifier is to take its input frequency (0 to 50 Mc) and to supply this signal at the specified levels over the entire frequency range. If the signal is below 50 cps, it does not get through the video amplifier. It is tapped off between R2 and R3 and supplied as a low level signal at the rear panel of the 5100A. Above 50 cps the signal goes through the video amplifier which consists of Q1 through Q6 and associated circuits. R7 is a low frequency gain adjust and L1 is a high frequency gain adjust. A portion of the signal at the emitter of Q6 is detected and supplied to a front panel meter as an indication that a synthesized signal is available at the output jack of the 5100A. The signal at the emitter of Q6 is kept at a constant level. At frequencies above 100 kc this is done with an automatic gain control circuit. This circuit operates as follows:

4-59. Q7 is part of an AND circuit which is used as a switch to turn the AGC circuits on and off. Below 100 Kc Q7 is turned off. This is the condition when the "0" buttons in the three most significant columns are pressed. When these three buttons are pressed, the base current which is supplied to Q7 for frequencies above 100 kc is allowed to leak off through CR3, CR4, and CR5. This turns Q7 off and its collector circuit goes to about 6 volts positive. This positive potential turns on CR7 and pulls the emitters of Q8 and Q9 more positive than their base levels, turning them off. When Q8 and Q9 turn off Q10 and Q11 turn off and no current flows from Q11 to amplifier A2Q2 in Mixer A22. However, the positive potential on Q7 also turns on CR9 allowing current to flow to amplifier A2Q2 in Mixer A22. R61 is adjusted to supply proper current to A2Q2 in Mixer A22.

4-60. For frequencies above 100 kc Q7 is on and the AGC circuits are allowed to assume their operating states. The signal is sampled at the emitter of Q6 and brought to differential amplifier Q8-Q9 through detectors CR6 and CR8. If the signal at the emitter of Q6 increases, the positive swing is coupled through CR6 to Q8, turning it on. The resulting negative swing of Q8's collector is connected to the base of Q10, turning it on. The negative swing at the emitter of Q6 is coupled through CR8 to Q9, turning it off. The resulting positive swing at Q9's collector is connected to the base of Q11 cutting down the flow of current through Q11 and thus also reducing current to A2Q2 in A22. The result is a decrease in gain. If the signal at the emitter of Q6 decreases, the action of the AGC circuits is such as to increase the gain of A2Q2 in A22.

4-61. POWER SUPPLY MODULE A25.

(Schematic Diagram: Figure 5-30)

4-62. RECTIFIER BOARD ASSEMBLY A25A1.

4-63. Rectifier Board A25A1 contains 3 full-wave bridge rectifier circuits and a network of voltage reference diodes which function as a pre-regulation network.

4-64. The three secondary windings of Power Transformer T1 are connected to full-wave bridge rectifier circuits on A25A1. The Power Supply circuit operating from terminals 5 and 6 of the Power Transformer provides reference voltages for the positive voltage and negative voltage outputs of A25A1, and bias voltages for the +6.3-volt and -12.6-volt regulators on A25A2. The reference voltage for the positive voltage supply is established by A1CR15, for the negative voltage supply by A1CR16; bias voltage for the +6.3-volt supply regulator is established by A1CR17, A1CR18, and A1CR19, for the -12.6-volt regulator by A1CR20, A1CR21, and A1CR22. Breakdown diodes A1CR13 and A1CR14 maintain voltages of A1Q1 collector and base with respect to ground for proper operation of the other diode reference circuits.

4-65. Transistors Q1 and Q2 are a Darlington configuration series voltage regulator for the positive voltage supply. They obtain their reference voltages from the supply described above.

4-66. REGULATOR BOARD ASSEMBLY A25A2.

4-67. The series regulator of the +6.3-volt supply operates on the output of the positive voltage supply already described. A reference voltage for the differential amplifier A2Q7A/B is established by A2CR1. A2R12 is the +6.3-volt adjustment control. The difference in voltages between A2Q7A and A2Q7B bases establishes a voltage level at A2Q4 base. The A2Q4 base-emitter voltage controls collector current through A2R5 and A2R7, to the reference voltage supply on A25A1, establishing the voltage at the base of A2Q3, which controls regulator transistor Q5 in the Darlington configuration +6.3-volt regulator. Transistor A2Q1 is the current limiting transistor for the +6.3-volt supply; its conduction is proportional to the voltage across R1 and the voltage is determined by the current through R1. As voltage across R1 increases, it increases the forward bias across A2Q1 base-emitter junction, increasing current through A2Q1, protecting Q5.

4-68. Operation of the -12.6 volt supply is similar to that of the +6.3-volt supply described above.

SECTION V

MAINTENANCE

5-1. INTRODUCTION.

5-2. This section provides maintenance and service information for the Model 5100A Frequency Synthesizer. Included are tables of recommended test equipment, an in-cabinet performance check which may be used to verify proper operation of the 5100A, troubleshooting aids, adjustment procedures, and schematic and block diagrams.

5-3. TEST EQUIPMENT.

5-4. Recommended test equipment for performance checking and troubleshooting is listed in Table 5-1. Other test instruments may be used if their specifications equal or exceed the required characteristics. The recommended measuring systems must be composed of a number of standard and special instruments connected together. Therefore the performance of the measurement system is being checked as well as the performance of the Frequency Synthesizer. The following measurement systems will require a considerable amount of effort to duplicate and also to verify that an "out of specification" reading is traceable to the instrument under test or to the test equipment.

5-5. CIRCUIT CHECK SWITCH.

5-6. A check of general operation is made by noting the circuit check meter indication as the switch is rotated through its four positions. All readings should be in the green area.

5-7. 5110A. The meter signal originates in the 5110A. The signal is amplified on Meter Board Assembly A4A1 and the meter monitors its output. If the meter reading is in the green section it is an indication that the signal from the 5110A is present and has the proper amplitude.

5-8. 6.3 VDC AND 12.6 VDC. A reading in the green section in these positions indicates that the power supply of the 5100A is operating properly.

5-9. OUTPUT. The meter signal is supplied from the OUTPUT AMPLIFIER Module A24. A reading in the green section is an indication that a synthesized signal is present at the OUTPUT jack.

5-10. IN-CABINET PERFORMANCE CHECK.

5-11. GENERAL. The In-Cabinet Performance Checks, Table 5-2, and Performance Check Test Card (to be filled out during incoming inspection) page 5-24a verify specifications and provide a permanent record of performance of each instrument. The In-Cabinet Performance Check verifies proper operation of all circuits in Model 5100A Frequency Synthesizer and may be used:

a. As part of an incoming inspection check of instrument specifications;

b. periodically, for instruments used in systems where maximum reliability is of utmost importance;

c. as part of a troubleshooting procedure to locate malfunctioning circuits, and

d. after any repairs or adjustments, before returning instrument to regular service.

5-12. MODULE DESIGNATIONS.

5-13. Table 5-4 gives the reference designations and names of all modules used in the Synthesizer.

5-14. INSTRUMENT COVER REMOVAL.

5-15. For access to modules in the Synthesizer, remove top and bottom instrument covers. Remove the four screws from the cover and slide cover toward rear of instrument.

5-16. SWING-OUT DECK.

5-17. Modules A13 through A24 are mounted on a swing-out deck. For access to these modules, remove three screws indicated by arrows silkscreened on rear panel, loosen two fasteners on deck, and swing out deck.

5-18. TEST CABLE.

5-19. A test cable ($\frac{1}{2}$ Part No. 05100-6180) can be used to substitute for a defective Mixer Divider Module (A5 through A11). If A5 is defective, remove module and connect Pin 2 of A4J5 to Pin 3 of A4J5 with test cable. Unit will now operate with resolution of .1 cps (right hand column of pushbuttons ineffective). If the defective mixer divider is one other than A5, remove the defective module, replace it with A5, and install Decade Test cable as explained above.

5-20. TROUBLESHOOTING.

5-21. The best approach to isolating trouble in the Model 5100A is first to obtain all possible information from the controls, indicators, and connectors, then logically apply this information to locate the defective unit or module. Figures 3-1 (Front Panel), 2-2 (Rear Panel), 5-7, 5-8, (Component Location), 5-11, 5-12, (Overall Block Diagrams) can be used to help understand operation and locate modules and parts. To further aid in analysis, each position of the CIRCUIT CHECK switch is discussed in Paragraphs 5-5 through 5-9. Table 5-3 (Troubleshooting Aids) lists basic trouble indications and checks for their cause. The In-Cabinet Performance Check, Table 5-2, is a good troubleshooting aid.

Table 5-1. Test Equipment Required

Instrument Type	Characteristics	Use*	Instrument Recommended
Frequency Synthesizer	Precision signal source .01 cps to 50 Mc (certified spurious down 100 db)	1	5100A/5110A
High Frequency Signal Generator	100 kc to 10 Mc, 606A Specifications	2, 3	606A
Oscilloscope	Display 500 Mc signal	2, 3	185B
Electronic Counter	Measure frequency to 40 Mc ± 1 count	1	5245L
Sweep Signal Generator	10 - 500 Mc	2	Jerrold 900B
Differential Voltmeter	0 to 100 vdc .01% accuracy	2, 3	740A
Wave Analyzer	Frequency to 1.5 Mc	1	310A
Synthesizer Driver	Provides stable 1 Mc signal	1	5110A
RF Millivoltmeter	1 mv to 500 mv to 50 Mc, 3% accuracy	1, 2, 3	411A with 11025A Probe & 11024A Type N "Tee" Probe Tip
Balanced Mixer	Frequency to 50 Mc, N. F. < 7 db	1	10514A
Frequency Doubler	Frequency to 50 Mc	3	10515A
DC Null Voltmeter	Dc null detection $\pm 2\%$	1, 2	413A
Frequency Standard	1 Mc sine wave	1	106A/B
DC Voltmeter	10 megohm input Z, 1% accuracy	3	412A
Low Noise Amplifier	40 db ampl. N. F. < 1 db	1	
AC Voltmeter	1 cps to 1 Mc $\pm 3\%$	1	403A with 500 μ f across meter
Variable Delay Line	Delay signal over frequency range	1	
Strip Chart Recorder	0.2% accuracy, full scale	1	Moseley 680
Tuned Voltmeter	1000 cps bandwidth, 13 to 130 cps	1	415D
Transistor Power Supply	0 to 40 volts dc	2, 3	723B
Variable ac Voltage Supply	0 to 300 Vac	2, 3	
Attenuator	0 to 100 db in 10 db steps, coaxial	2, 3	355D
Attenuator	0 to 12 db in 1 db steps	2, 3	344C
Feed-thru Termination	50-ohm feed-thru	2, 3	11048B
Termination	50-ohm BNC	2, 3	1250-0207
Termination	50-ohm coaxial	2, 3	908A
Connector	BNC Tee (4 required)	2, 3	1250-0072
RMS Voltmeter	Range to 3V, accuracy $\pm 2\%$	1	3400A
Coaxicon Tool		For removing connectors in Connector Block A4 05100-G004	Amphenol #305183-8 20 Type IV
Adaptor	BNC to N	2, 3	

*1, Performance Check; 2, Circuit adjustment; 3, Troubleshooting.

Table 5-2. In-Cabinet Performance Check

1. OUTPUT FREQUENCY:

Connect Synthesizer front-panel OUTPUT to Counter input. Set Counter to measure FREQUENCY, 1 sec TIME BASE (gate time). Set Counter controls for operation from external frequency standard, use 1 Mc from FREQUENCY STANDARD output of Model 5102A under test as time base for Counter.

Using front-panel pushbuttons of the Model 5100A, select output frequencies of 11, 111, 111. 11; 22, 222, 222. 22; 33, 333, 333. 33; 44, 444, 444. 44; 15, 555, 555. 55; 16, 666, 666. 66; 17, 777, 777. 77; 18, 888, 888. 88; 19, 999, 999. 99; 10, 000, 000. 00; and 1, 000, 000. 00 cps. The Counter display should be the same as the frequency selected on the Model 5100A, ± 1 cps. Although the Counter does not display the frequency selected in the tenth- and hundredth-of-a-cycle-per-second columns, an output as indicated above is a legitimate check for these columns. If no signal were present in one of these columns, the output frequency would be zero cps. Note: This is not an accuracy check. If the above frequencies can be selected, any frequency within the range of the Synthesizer can be created.

2. DIGITAL FREQUENCY SELECTION:

Connect Model 5100A LO LEVEL output to DC Amplifier with 20 db gain and connect to Counter. Set Counter FUNCTION control to 1 Period Average, TIME BASE (gate time) to 1 msec. Using the Model 5100A front-panel pushbuttons, select the following frequencies and note the period on the Counter

FREQUENCY (cps)	PERIOD (sec)
000, 000, 000. 0	counter counts continuously
000, 000, 000. 1	10, 000
000, 000, 000. 2	5, 000
000, 000, 000. 3	3, 333
000, 000, 000. 4	2, 500
000, 000, 000. 5	2, 000
000, 000, 000. 6	1, 666
000, 000, 000. 7	1, 429
000, 000, 000. 8	1, 250
000, 000, 000. 9	1, 111
000, 000, 001. 0	1, 000
000, 000, 002. 0	500
000, 000, 003. 0	333
000, 000, 004. 0	250
000, 000, 005. 0	200
000, 000, 006. 0	166
000, 000, 007. 0	143
000, 000, 008. 0	125
000, 000, 009. 0	111

Change Counter FUNCTION control to FREQUENCY, TIME BASE (gate time) to 1 sec and connect to OUTPUT jack. Press the 0 pushbuttons in the right two columns of the Model 5100A. The Counter should indicate directly any other frequency selected by the remaining 8 columns on the Synthesizer front panel.

Repeat the above procedure, using appropriate programming of the rear panel connections of J7, J8, and J9.

SWITCHING TIME:

Set Model 5100A FREQUENCY SELECT switch to Local and select desired output frequency on pushbuttons, except do not push any buttons in the column(s) to be switched electrically. Switching time test requires two signals alternately turning on two frequencies. Be sure the difference between the two frequencies is sufficient to be observable on the Oscilloscope. An "on" signal is -12.6 volts applied between the programmed connection and ground. An "off" signal is a voltage between 0 and +2 volts applied between the programmed connection and ground; the positive voltage ensures that the switch is turned off. Pulse width of the switching signals should be at least 20 μ sec, rise time and decay time of the switching signals should be less than 1 μ sec.

Connect one of the switching signals to one vertical amplifier input of a dual trace Oscilloscope. Connect the Model 5100A OUTPUT signal to the other vertical amplifier input. Synchronize the Oscilloscope sweep with the (trigger or sync) output of the pulse generator. Set the Oscilloscope sweep speed to 10 μ sec/cm; for accurate measurement of switching time, there should be a delay

Table 5-2. In-Cabinet Performance Check (cont'd)

SWITCHING TIME (cont'd):

between start of sweep and time when switching signal appears on screen. The pattern on the Oscilloscope will show the switching between the two frequencies programmed and one of the switching signals (the other switching signal will be complementary). Switching time is measured from the time the switching signal turns "on" to the time when the signal it controls is stabilized at its peak value.

3. OUTPUT VOLTAGE:

Monitor output frequencies with Counter.

0 to 50 cps	Connect AC Voltmeter to Model 5100A LO LEVEL OUTPUT connector. Select output frequency of 00,000,000.00. Slowly turn the SEARCH OSCILLATOR dial from 0 to 5, observing Voltmeter indication. The decrease in voltage near 0 is due to frequency response characteristics of Voltmeter.
50 cps to 100 Kc	Connect AC Voltmeter to Synthesizer front-panel OUTPUT jack. Terminate the Synthesizer output in a 50-ohm resistive load. Using appropriate pushbuttons, vary output frequency with SEARCH OSCILLATOR dial. Observe that the voltage is 1 volt rms, + 2 db, -4 db, from 50 cps to 100 Kc.
100 Kc to 10 Mc	Terminate OUTPUT connector with 50 ohms and connect Φ 3400A RMS Voltmeter to OUTPUT connector. Observe that the output voltage is 1 volt rms \pm 1 db from 100 Kc to 10 Mc.
10 Mc to 50 Mc	Terminate OUTPUT connector with 50 ohms and connect Φ 411A RF Millivoltmeter to OUTPUT connector. Observe that the output voltage is 1 volt rms \pm 1 db from 10 Mc to 50 Mc.

4. SEARCH OSCILLATOR:

Use same setup and procedure as for Item 2, except select frequency in desired column by pressing "S" pushbutton in that column and using SEARCH OSCILLATOR dial on front panel (set SEARCH toggle switch to Local).

Switch SEARCH toggle switch to REMOTE and repeat above procedure, controlling SEARCH OSCILLATOR with a bias voltage varying between -1 and -11 volts applied at the rear panel SEARCH (-1 to -11v) jack.

5. SIGNAL-TO-PHASE NOISE RATIO:

Make the measurements using setup shown in Figure 5-1 and the following general procedure:

1. Connect equipment as shown except for the phase control to the reference unit.
2. Connect the same frequency f_0 , from the reference unit to the mixer, as the frequency to be measured. Frequency should be above 200 kc.
3. Calibrate system by off-setting frequency of 5100A under test by 1 kc. Set attenuator to 50 db.
4. Adjust voltmeter range switch for an on-scale reading. Note the range setting and the meter reading in db. This is the reference signal level.
5. Set the 5100A to the same frequency as the reference unit. Set attenuator to 10 db. A minimum of 10 db must remain between the 5100A and the mixer for linear operation. Vary the delay for minimum dc output on the Phase Meter, which indicates the desired condition of phase quadrature.

Table 5-2. In-Cabinet Performance Check (cont'd)

5. SIGNAL-TO-PHASE NOISE RATIO (cont'd):

6. Connect the phase control lead to the reference unit. This insures phase lock during the measurement.
7. Adjust the AC Voltmeter for an on-scale reading. Note this reading in db and add one db for correction of the average reading meter to rms. The difference in this sum and the reference reading, obtained in Step 5, is the signal-to-noise ratio. It is in a 0.5 cps to 15 kc bandwidth. Since a demodulated bandwidth is equal to half the RF spectrum bandwidth, the measurement is of a 30 kc bandwidth centered on the signal, excluding a one cps band centered on the signal. Subtract 3 db, assuming equal noise from both generators.

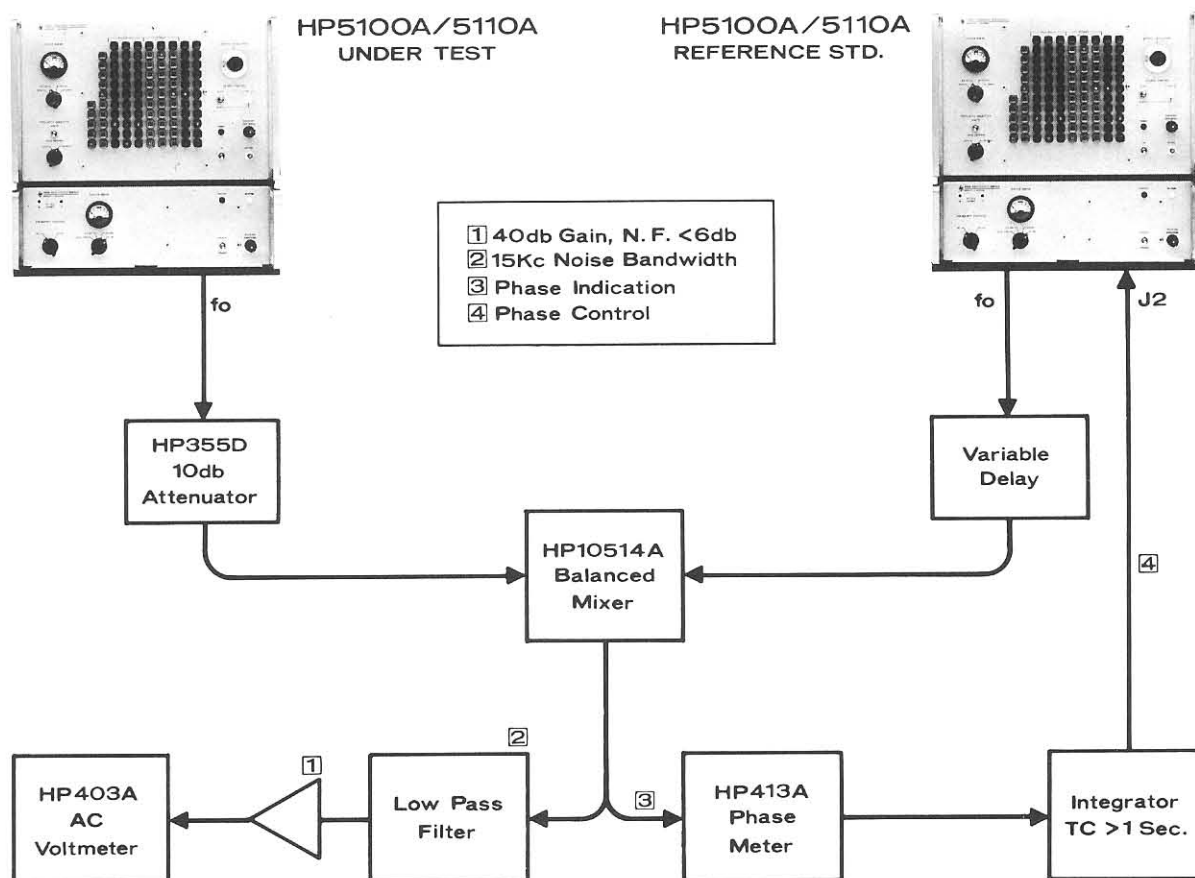
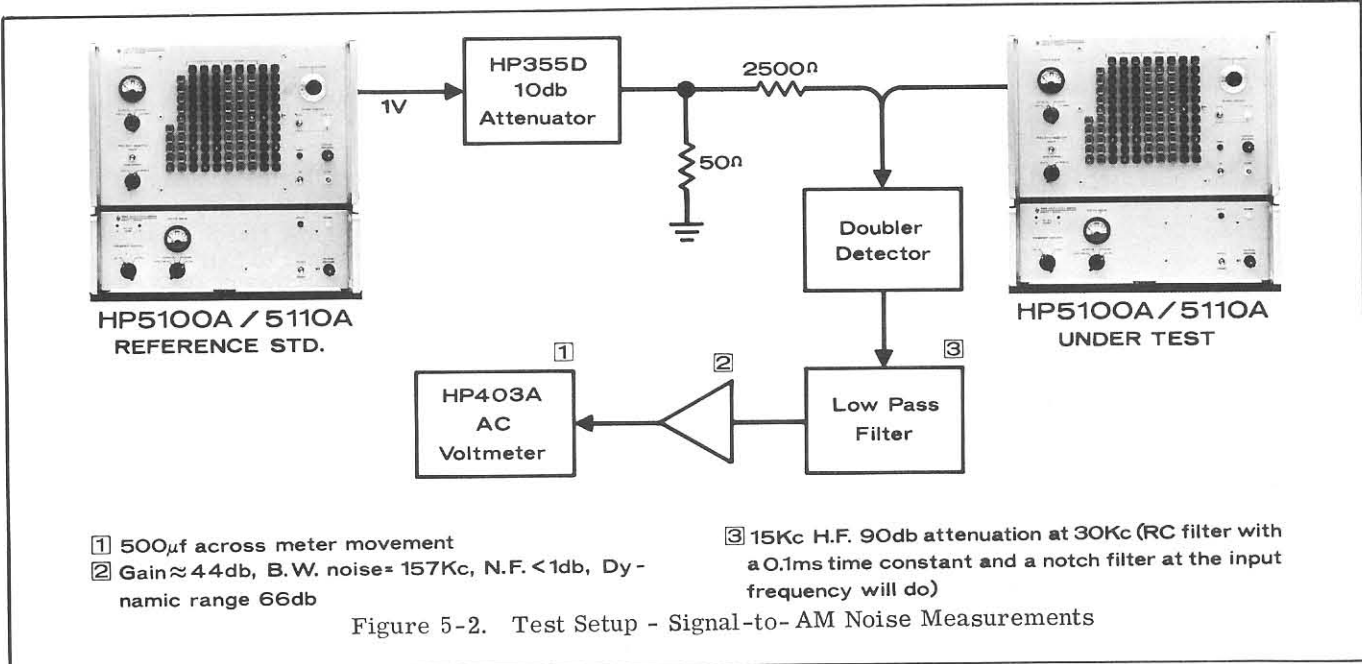


Figure 5-1. Test Setup - Signal-to-Phase Noise Measurements

6. SIGNAL-TO-AM NOISE RATIO (above 100 kc):

Connect equipment as shown in Figure 5-2. Select output frequency using front-panel pushbuttons (do not use SEARCH OSCILLATOR). Set output frequency of Ref Model 5100A to be same as Model 5100A under test plus 100 cps. Turn on amplifier and measure output voltage on db scale of special AC Voltmeter. This is the reference signal; its level is 60 db down with respect to the carrier. Disconnect the signal from the reference Model 5100A. Read the new level on the voltmeter. This reading, referred to the reference level, which was 60 db down, gives the signal-to-AM noise measurement.

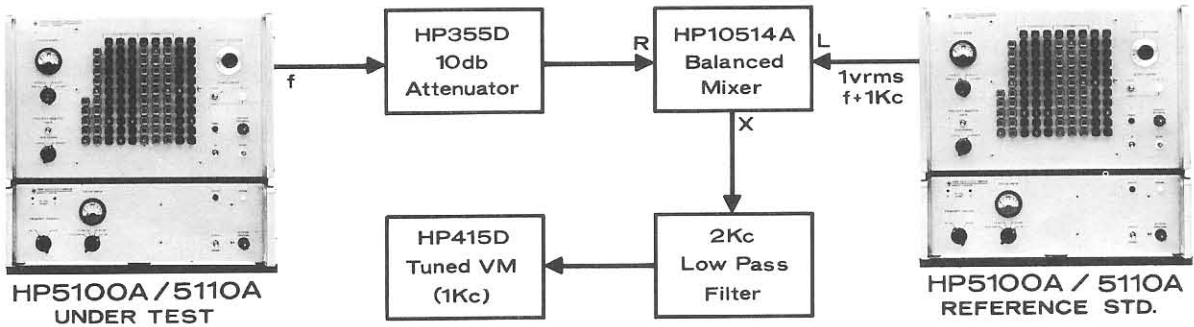
Table 5-2. In-Cabinet Performance Check (cont'd)



7. RMS FRACTIONAL FREQUENCY DEVIATION:

Rms fractional frequency deviation is a measure of the spectral purity of a signal. To measure rms fractional frequency deviation directly requires considerable engineering effort in the design and construction of appropriate equipment. The rms fractional frequency deviation is checked indirectly in the checks of signal-to-phase noise, signal-to-am noise, signal-to-spurious signal, and signal-to-harmonic signal ratios; if these are within their specifications, then the rms fractional frequency deviation of the signal is within its specification.

8. SPURIOUS SIGNALS:



Make the measurements using setup shown in Figure 5-3 and the following procedure:

1. Connect the equipment as shown in Figure 5-3.

Table 5-2. In-Cabinet Performance Check (cont'd)

2. Set Attenuator to 80 db and range switch on 415D to 30 or 40.
3. With reference local oscillator at 22 Mc and the unit under test at 22.001 Mc, adjust the tuned voltmeter for an on-scale reading. Note the meter reading and range switch setting in db. This is the reference reading.
4. Set the unit under test to 16.99 Mc and offset reference local oscillator 1 kc (example 16.181 Mc). Set attenuator to 10 db and adjust the Voltmeter for an on-scale reading. The difference between this reading and the reference reading is the signal-to-spurious signal ratio (for other spurious checks see Table 5-3).
5. Following is example of settings:

The reference settings are as follows:

Attenuator at 80 db	80
415D at 30 (X2)	60
Meter set at 0	0
Total	<hr/> 140 db

The spurious readings are as follows:

Attenuator at 10 db	10
415D at 40 (gain of 20 db, 60 - 20)	40
Meter reads 1.5 db (X2)	-3
Total	<hr/> 47 db

$$\text{Signal/Spurious} = 140 - 47 = 93 \text{ db}$$

NOTE: The tuned voltmeter is calibrated for an input from a square law device (output voltage proportional to power input). The db reading must be doubled when using the voltmeter in the circuit of Figure 5-3. That is, an indication of 1 db is really 2 db in this application.

Disconnect Synthesizer under test and note the noise level. This level represents the ultimate sensitivity of the measurement test setup.

9. HARMONIC SIGNALS:

Use ☉ 310A Wave Analyzer for signals up to 500 kc. Use equipment shown in Figure 5-3 for frequencies of 500 kc and higher and proceed as follows:

1. Connect output of Model 5100A under test to "L" input of ☉ 10514A.
2. Offset reference local oscillator 1 kc from frequency of Model 5100 under test and connect to 355D set to 70 db.
3. Connect output of 355D to "R" input of ☉ 10514A. The rest of the test setup is shown in Figure 5-3.
4. Adjust 415D for an on-scale reading. Note meter reading and range setting in db. This is the reference reading.
5. Offset output frequency of reference Synthesizer 1 kc from frequency of desired harmonic of output. Set 355D to 40 db.

Note: The level of signal input to the mixer should be 10 mv or less in order to avoid generation of sizable low order harmonic content within the mixer itself.

6. Observe reading on Voltmeter. The difference between this reading and the reference reading is the signal-to-harmonic signal ratio for that harmonic of the Model 5100A under test.

Table 5-3. Troubleshooting

OUTPUT ABSENT Mc	OUTPUT PRESENT Mc	REASON	CHECK
9	19, 29, 39 & 49	No 390 Mc	A13 Multiplier Assembly 39/390 Mc or A20CR5 diode switch in A20 Switch Assembly 350/390 Mc
11	1, 21, 31 & 41	No 380 Mc	A14 Multiplier Assembly 38/380 Mc or A20CR4 diode switch in A20
21	1, 11, 31 & 41	No 370 Mc	A15 Multiplier Assembly 37/370 Mc or A20CR3 diode switch in A20
31	1, 11, 21 & 41	No 360 Mc	A16 Multiplier Assembly 36/360 Mc or A20CR2 diode switch in A20
41	1, 11, 21 & 31	No 350 Mc	A17 Multiplier Assembly 35/350 Mc or A20CR1 diode switch in A20
1	2, 3, 4, 5, 6, 7, 8 & 9	No 31 Mc	Cable from Φ 5110A or A19A9 diode switch in A19 Switch Assembly 30/39 Mc
2	1, 3, 4, 5, 6, 7, 8 & 9	No 32 Mc	Cable from Φ 5110A or A19A8
3	1, 2, 4, 5, 6, 7, 8 & 9	No 33 Mc to 2nd UHF Mixer	A19A7 diode switch in A19
4	1, 2, 3, 5, 6, 7, 8 & 9	No 34 Mc	Cable from Φ 5110A or A19A6
5	1, 2, 3, 4, 6, 7, 8 & 9	No 35 Mc	Cable from Φ 5110A or A19A5
6	1, 2, 3, 4, 5, 7, 8 & 9	No 36 Mc	Cable from Φ 5110A or A19A4
7	1, 2, 3, 4, 5, 6, 8 & 9	No 37 Mc	Cable from Φ 5110A or A19A3
8	1, 2, 3, 4, 5, 6, 7 & 9	No 38 Mc	Cable from Φ 5110A or A19A2
9	1, 2, 3, 4, 5, 6, 7 & 8	No 39 Mc to 2nd UHF Mixer	A19A1 diode switch in A19
9, 19, 29, 39 or 49	10, 18, 28, 38 & 48	No 39 Mc	Cable from Φ 5110A
10	1, 2, 3, 4, 5, 6, 7, 8 & 9	No 30 Mc	Cable from Φ 5110A or A19A20
1, 000, 000. 00	1, xxx, xxx. xx (x is not 0)	No 3. 0 Mc	Cable from Φ 5110A to A3 3-4 Mc Switch
1, 111, 000. 00	1, xxx, xxx. xx (x is not 1)	No 3. 1 Mc	Cable from Φ 5110A to A3 3-4 Mc Switch
1, 222, 000. 00	1, xxx, xxx. xx (x is not 2)	No 3. 2 Mc	Cable from Φ 5110A to A3 3-4 Mc Switch
1, 333, 000. 00	1, xxx, xxx. xx (x is not 3)	No 3. 3 Mc	Cable from Φ 5110A to A3 3-4 Mc Switch

Table 5-3. Troubleshooting (cont'd)

OUTPUT ABSENT Mc	OUTPUT PRESENT Mc	REASON	CHECK
1, 444, 000. 00	1, xxx, xxx. xx (x is not 4)	No 3. 4 Mc	Cable from 5p 5110A to A3 3-4 Mc Switch
1, xxx, 000. 00 (x is 5)	1, xxx, xxx. xx (x is not 5)	No 3. 5 Mc	Cable from 5p 5110A to A3 3-4 Mc Switch
x is 6	x is not 6	No 3. 6 Mc	Cable from 5p 5110A to A3 3-4 Mc Switch
x is 7	x is not 7	No 3. 7 Mc	Cable from 5p 5110A to A3 3-4 Mc Switch
x is 8	x is not 8	No 3. 8 Mc	Cable from 5p 5110A to A3 3-4 Mc Switch
x is 9	x is not 9	No 3. 9 Mc	Cable from 5p 5110A to A3 3-4 Mc Switch
No output for any frequency		No 33, 24 or 3 Mc	Cable from 5p 5110A or defective A18 33/330 Multiplier Assembly
No output for any frequency		Fuse on rear panel has to be replaced.	Overloading in Remote circuit or in pushbutton switch, Assembly A1

ALL FREQUENCIES IN MEGACYCLES ASTERISK (*) INDICATES SPURIOUS FREQUENCIES		TROUBLE
TEST NO. 1 CALIBRATION TEST FREQ. 22.000 SPURIOUS 22.001 (NOTE: USE FIGURE 5-3 AS A TEST SET-UP WHEN SETTING UP REFERENCE AND LOOKING FOR SPURIOUS FREQUENCIES)		
TEST NO. 2 TEST FREQ. 16.99 SPURIOUS 16.18 		A12 FINAL MIXER OUTPUT TUNING
TEST NO. 3 TEST FREQ. 11.03 SPURIOUS 11.36 		A21 LOW BIAS HIGH MIXER DRIVE

Table 5-3. Troubleshooting (cont'd)

<p>TEST NO. 4 TEST FREQ. 11.30 SPURIOUS 10.60</p> <p>2nd HARMONIC OF 30.3MC ADDS TO 330MC AND APPEARS IN SECOND MIXER OUTPUT</p> <p>A12 A21 A22 A23</p>	<p>A21 BAD OUTPUT FILTER</p>
<p>TEST NO. 5 TEST FREQ. 19.70 SPURIOUS 10.00</p> <p>10th HARMONIC 39MC APPEARS IN OUTPUT OF SECOND MIXER</p> <p>A12 A21 A22 A23</p>	<p>A22 LOW BIAS BAD 30-39 SWITCH</p>
<p>TEST NO. 6 TEST FREQ. 16.95 SPURIOUS 16.00</p> <p>11th HARMONIC OF 36MC APPEARS IN OUTPUT OF SECOND MIXER</p> <p>A12 A21 A22 A23</p>	<p>A22 LOW BIAS BAD 30-39 SWITCH</p>
<p>TEST NO. 7 TEST FREQ. 11.11 SPURIOUS 42.11</p> <p>2nd HARMONIC 31MC ADDS TO 360.11MC TO GIVE 422.11MC</p> <p>A12 A21 A22 A23</p>	<p>A22 OUTPUT TUNING BAD OUTPUT FILTER</p>
<p>TEST NO. 8 TEST FREQ. 49.50 SPURIOUS 53.00 (LOCAL OSCILLATOR SET TO 26.5MC AND DOUBLER USED TO OBTAIN 53MC)</p> <p>6th HARMONIC OF 399.5MC MIXES WITH 7th HARMONIC OF 350MC</p> <p>A12 A21 A22 A23</p>	<p>A23 DIODE UNBALANCE</p>

Table 5-3. Troubleshooting (cont'd)

<p>TEST NO. 9 TEST FREQ. 22.00 SPURIOUS 37.00</p> <p>11th HARMONIC OF 37MC MIXES WITH 370MC TO GIVE 37MC</p>	<p>A23 DIODE UNBALANCE</p>
<p>TEST NO. 10 TEST FREQ. 31.40 SPURIOUS 32.40</p> <p>31.40MC OUTPUT MIXES WITH 330MC DUE TO COUPLING OF POWER SUPPLY LEADS</p>	<p>A25 COUPLING DECOUPLING CAPACITORS</p>
<p>TEST NO. 11 TEST FREQ. 35.70 SPURIOUS 36.40</p> <p>35.7MC OUTPUT MIXES WITH 360.7MC DUE TO COUPLING OF POWER SUPPLY LEADS</p>	<p>A25 COUPLING DECOUPLING CAPACITORS</p>
<p>TEST NO. 12 TEST FREQ. 8.90 SPURIOUS 9.90</p> <p>SPURIOUS SIGNAL 1MC BELOW 390MC</p>	<p>A13 INPUT TUNING</p>
<p>TEST NO. 13 TEST FREQ. 11.11 SPURIOUS 19.89</p> <p>360.11MC MIXES WITH 380MC</p>	<p>A22 BALANCE ADJUST</p>

Table 5-3. Troubleshooting (Cont'd)

"False" Spurious Measurements

Care should be taken to be sure that spurious signals are true spurious signals, and that the levels measured are true. Certain traps are to be avoided. For instance, a response will occur if $N \times f_D - M \times f_{LO} = 1 \text{ kc}$, where f_D is the test signal frequency at high level and f_{LO} is the local oscillator frequency and N and M are integers. This response is created in the mixer and is not a true spurious response. $M \times f_{LO}$ is necessarily present, $N \times f_D$ depends, non-linearly, on the level of f_D . If the level of f_D is dropped, this response will decrease more rapidly than the f_D level. This test can be applied as a check on the authenticity of any spurious signal detected; it should vary linearly with the input level.

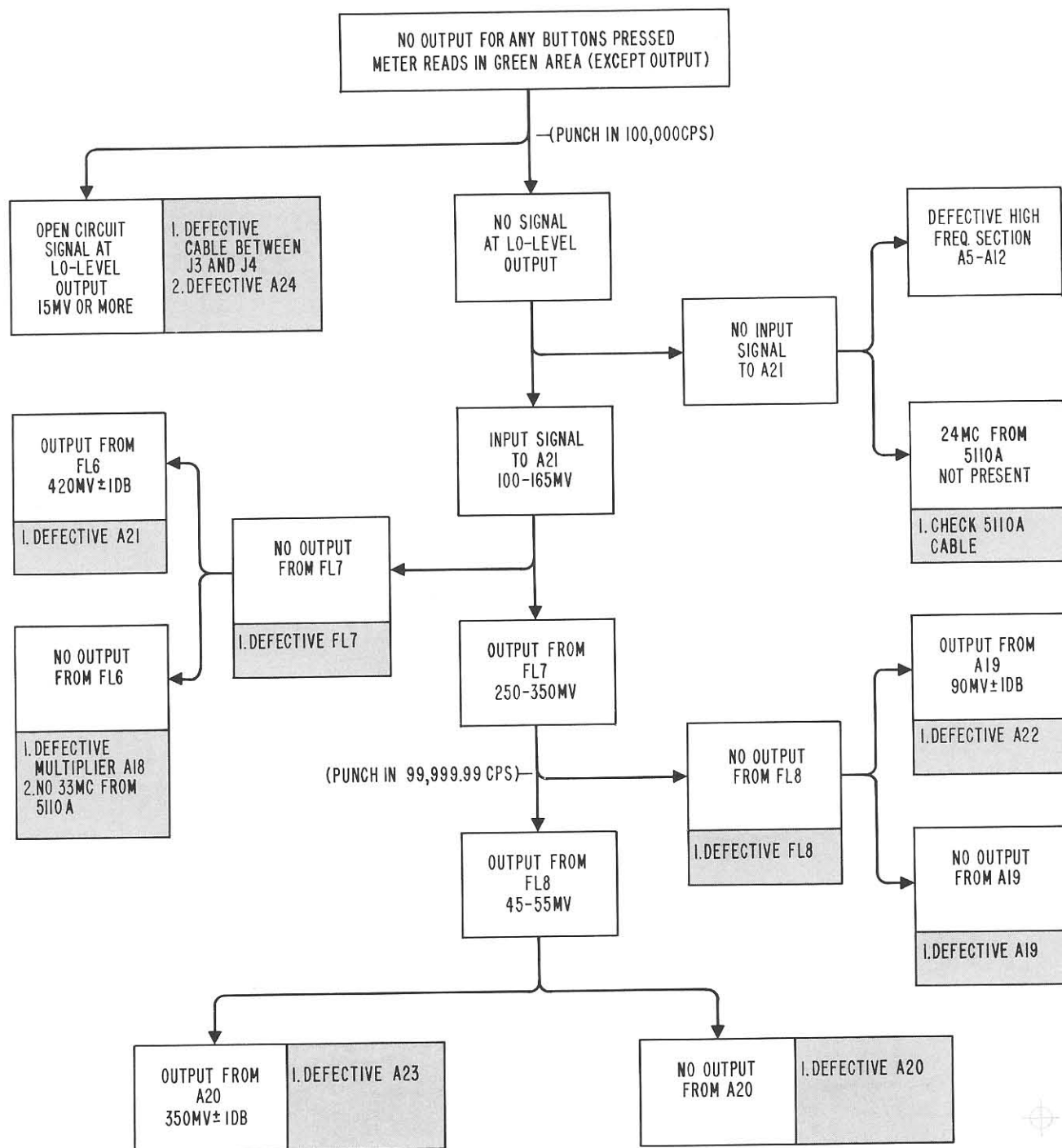









Figure 5-4. Troubleshooting Chart

Table 5-3. Troubleshooting (cont'd)

Check Mixer/Filter A12 and Mixer/Dividers A5-A11 as follows: remove Mixer/Filter A12 and check ac signal level on Connector Block A4 socket.

PIN	A12	SIGNALS	AC VOLTAGES
1		3-4 Mc from A3J1	50 mv
2		3.0 - 3.1 Mc from A11	35 - 60 mv
3		NC	-
4		-Dc Voltage (do not short to ground)	-
5		30 - 31 Mc to A21	-
6		24 Mc from A4A2	1 v rms
7		+Dc Voltage (do not short to ground)	-


 Toward
front
Panel

Socket for A5-A11 is same except pin 3 is 3.0-3.1 Mc output to next assembly and pin 5 is blank.

- No 3-4 Mc signal at pin 1 - defective cable from A4 to A3.
- No 3.0-3.1 Mc signal at pin 2 - remove Mixer/Divider A8 and check ac signal level on socket for A8. Acceptable signal level same as before except 24 Mc level can be .5 to 1V. If signal levels are normal then defective assembly is A8, A9, A10 or A11. If 3.0-3.1 Mc signal is absent, then defective assembly is A5, A6, or A7. If no 24 Mc at pin 6 see (c) or (d). To split the possible defective assemblies in half, check signal levels again on socket of either A6 or A10. If signal levels are normal on socket of A6, then A6 or A7 is defective. If 3.0-3.1 Mc signal is absent, then A5 is defective. If signal is normal at socket at A10, then A10 or A11 is defective. If 3.0-3.1 Mc signal is absent on socket of A10, then A8 or A9 is defective.
 Note: Decade test cable ϕ Stock #05100-6180 (3" length with mating connectors to socket) can substitute for A5. Remove A5 and connect test cable between pin 2 and pin 3 of A5 socket.
- No 24-Mc signal at pin 6 on socket for A12 - defective amplifier board assembly A4A2.
- No 24-Mc signal at pin 6 on socket for A11 - defective A4A3.
- No 24-Mc signal at pin 6 on socket for A10 to A5 - defective A4A4.

Table 5-4. Assembly or Module Identifications

A1 Pushbutton Assembly	05100-6003	A16 Multiplier 36/360 Mc	05100-6019
A2 Search Oscillator	05100-6005	A17 Multiplier 35/350 Mc	05100-6020
A3 3-4 Mc Switch	05100-6006	A18 Multiplier 33/330 Mc	05100-6021
A4 Connector Block	05100-6004	A19 30 to 39 Mc Switch	05100-6010
A5 thru		A20 350 to 390 Mc Switch	05100-6011
A11 Mixer/Divider - 3.0-3.1 Mc	05100-6001	A21 1st UHF Mixer	05100-6012
A12 Mixer/Filter 30-31 Mc	05100-6002	A22 2nd UHF Mixer	05100-6013
A13 Multiplier 39/390 Mc	05100-6016	A23 3rd UHF Mixer	05100-6014
A14 Multiplier 38/380 Mc	05100-6017	A24 Output Amplifier	05100-6015
A15 Multiplier 37/370 Mc	05100-6018	A25 Power Supply	05100-6007

5-22. ADJUSTMENTS.

5-23. GENERAL.

5-24. There is no periodic adjustment necessary for the proper operation of the 5100A. All internal adjustments, especially the power supply voltages, should not be adjusted until checks prove operation of the Frequency Synthesizer is out of specifications. The power supply in this instrument is extremely stable for long periods of time. If the voltages are essentially correct (± 100 mv for 6.3 volts and ± 200 mv for -12.6 volts) and regulate within ± 100 microvolts between low and high line voltage, there is no reason to make an adjustment. Do not make adjustments with a 1% voltmeter.

5-25. Adjustments should not be attempted until it is verified that the module in question is at fault. In the following paragraphs normal operation of each module or assembly is described first followed by adjustment procedure. The input level, frequency, power to the module, and the measuring technique should all be checked before assuming the module is in need of adjustment or repair. See Figures 5-7 through 5-9 for location of modules and assemblies.

5-26. PUSHBUTTON SWITCH ASSEMBLY A1.

5-27. NORMAL OPERATION. When the front panel FREQUENCY SELECTION switch is in the LOCAL position, the Model 5100A output frequency is selected by pressing one pushbutton in each column, connecting -12.6 volt enabling voltage to the appropriate switch matrices in the 3 to 4 Mc Switch Module A3. Mechanical interlocking prevents pressing more than one pushbutton in any column.

5-28. OPERATIONAL CHECK. The Pushbutton Switch Assembly is checked by using the procedure of Item 2 of the In-cabinet Performance Check, Table 5-2.

5-29. SEARCH OSCILLATOR MODULE A2.

5-30. NORMAL OPERATION. Transistor Q1 is a Colpitts oscillator, operating in the 3 to 4 Mc range, controlled by a -1 to -11-volt dc signal applied between varactors CR5 and CR6. The output is amplified by Q2 and after level adjustment and filtering is available at J1. Output level is nominally 50 mv.

5-31. OPERATION CHECKS. The tracking characteristics of the Search Oscillator are checked in Item 4 of the In-cabinet Performance Check, Table 5-2.

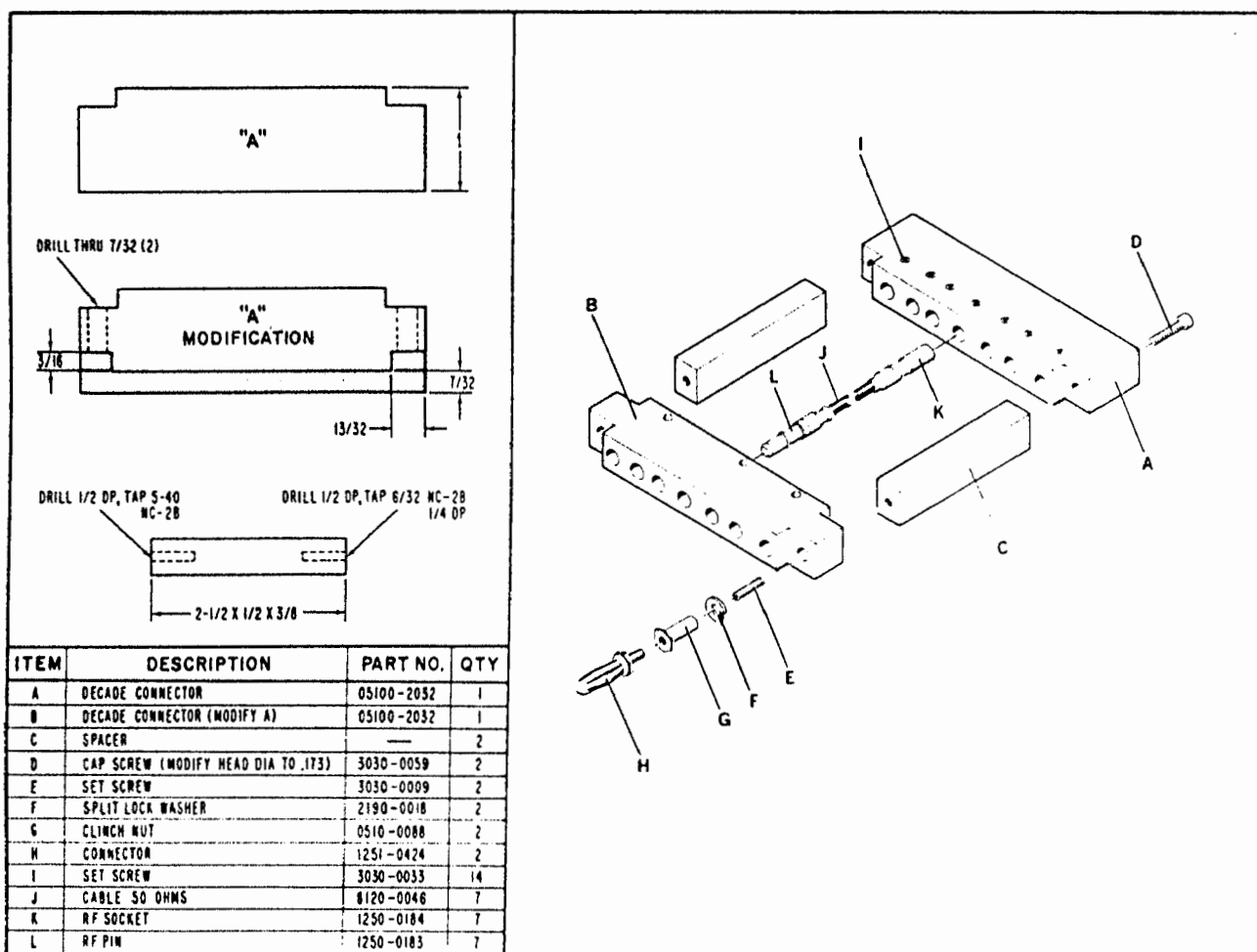


Figure 5-5. Extension Connector (Mixer Connector)

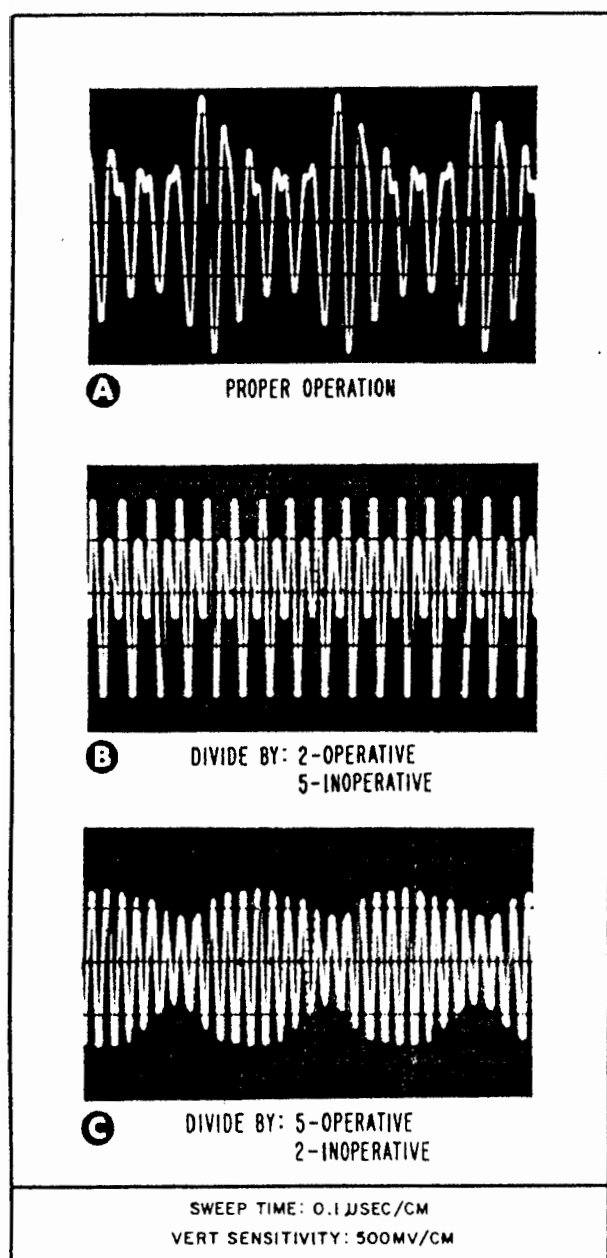


Figure 5-6. Divider Waveforms

5-32. To measure the output level of the Search Oscillator, disconnect the BNC-terminated cable labeled "Search Oscillator", and terminate the Search Oscillator output with a 50-ohm load. Measure the output voltage over the 3 to 4 Mc range of the Search Oscillator using an $\frac{1}{2}$ Model 411A RF Millivoltmeter. The output should be 50 mv \pm 1/2 db over the frequency range.

5-33. The variation in output level may be centered about 50 mv using the following procedure. Set the Search Oscillator frequency to 3.5 Mc (SEARCH OSCILLATOR dial to 5). Adjust R4 so output is 52 mv. Repeat procedure of Paragraph 5-32 to check centering of output voltage variation. Readjust R4 as necessary for optimum centering of output voltage variation.

5-34. TRACKING ADJUSTMENT. Disconnect the BNC-terminated "Search Oscillator" cable from the Search Oscillator output BNC connector. Connect an electronic counter to the output connector through a 50-ohm feed-thru termination. Set SEARCH switch to REMOTE. Connect -1 volt dc from a voltage standard ($\frac{1}{2}$ Model 741A or equivalent) to the rear-panel SEARCH connector. Adjust L1 so frequency observed on the counter is 3.00 Mc.

5-35. Change the voltage at the SEARCH oscillator to -11 volts. Frequency observed on counter should be 4.000 Mc. If not, note how many kc and which direction the difference is. Change the voltage at the SEARCH connector back to -1 volt. Adjust FREQ ADJUST R16 so that the output frequency is exactly the same number of kc from 3.000 Mc and in the same direction as was observed at 4.000 Mc. (If the 4 Mc frequency reading was 10 kc higher than 4.000 Mc, adjust R16 so 3 Mc output is 3.010 Mc.) Now adjust L1 to return the frequency to exactly 3.000 Mc.

5-36. Switch the voltage at the SEARCH oscillator block to -11 volts and note the output frequency; it should be 4.000 Mc. If it is not 4.000 Mc, repeat the procedure of Paragraph 5-35 until tracking is correct.

5-37. Switch the voltage at the SEARCH oscillator between -1 and -11 volts in 1-volt steps. Each 1-volt change should produce a 100 kc increase in output frequency. The output frequency should be within \pm 50 kc of the correct frequency.

5-38. 3 TO 4 MC SWITCH MODULE A3.

5-39. NORMAL OPERATION. The 3 to 4 Mc Switch Module contains 88 diode switch matrices, corresponding to 88 front-panel pushbuttons in the columns with the "S" pushbuttons. One switch matrix in each column is turned "on" by applying a -12.6 volt enabling voltage from a LOCAL or REMOTE source as selected by the front panel FREQUENCY SELECTION switch. Each row of pushbuttons is represented by an input to A3. Each column of pushbuttons is represented by an output from A3. Insertion loss of the switch matrices is typically less than 3 db, and the "on/off" ratio in column 3 is greater than 105 db, in column 4 greater than 93 db, and in columns 5-10 greater than 83 db.

5-40. OPERATIONAL CHECKS. On-off switching action and switching time of the 3 to 4 Mc Switch Assemblies are tested using the procedures of Item 2 of the In-cabinet Performance Check, Table 5-2. The test below for insertion loss may be helpful in checking for a switch with marginal performance.

5-41. Insertion loss is the measure of switch conduction when the switch is "on", comparing the output signal to the input signal, with the input signal as 0 db reference.

5-42. The inputs to the 3 to 4 Mc Switch Module are J9, and J10 through J19, corresponding to row S, and rows 0 through 9, respectively. The outputs of the 3 to 4 Mc Switch Module are J1 through J8, corresponding to columns 3 through 10 respectively, on front panel, with column 3 being the first column from

the left with the "S" pushbutton and column 10 being the right one. There is one switch matrix in the 3 to 4 Mc Switch for each of the digital frequency selection pushbuttons on the front panel which have "S" pushbuttons.

5-43. To measure insertion loss, connect the input of the desired row through a BNC "T". Connect another BNC "T" in the output for the desired column. Using the appropriate front panel pushbutton or remote programming, turn the switch "on". Measure the input on an ϕ 3400A RMS Voltmeter (use db scale). Measure the output signal of the switch matrix with the Voltmeter. The difference in db readings is the insertion loss of that switch matrix. Insertion loss is normally 1.5 db, ± 1 db in columns 3 and 4, and 2.0 db, $\pm 1/2$ db in columns 5 through 10.

5-44. CONNECTOR BLOCK A4.

5-45. NORMAL OPERATION. The Connector Block provides power and signal connections for Modules A5 through A12. It provides amplification for the 24 Mc signal from the 5110A before connecting it to Modules A5 through A12. The 3 Mc signal from the 5110A is amplified here before being connected to the front panel CIRCUIT CHECK meter. The -12.6 volts and +6.3 volts from Power Supply Module A25 are normalized here before being connected to the front panel meter.

5-46. OPERATIONAL CHECK. The connector Block is checked indirectly by proper operation of the Model 5100A in the In-cabinet Performance Check, Table 5-2.

5-47. A special tool for removing Coaxicon connectors from the Connector Block is made by AMP Inc. The part number is A-mp No. 305183-8, Type IV.

5-48. MIXER/DIVIDERS A5-A11.

5-49. NORMAL OPERATION. The first mixing stage combines the 1V 24 Mc signal at Pin 6 and the 60 mv 3 or 3.0 Mc to 3.1 Mc signal at Pin 2. The sum of these two signals (27.0 Mc to 27.1 Mc) is added to the 50 mv 3 to 4 Mc signal at Pin 1, and the sum of these (30 Mc to 31 Mc) is filtered and divided by 10 to produce an output signal of 3.0 Mc to 3.1 Mc at 60 mv. All signal and power connections are made through Connector Block A4.

5-50. OPERATIONAL CHECKS. To quickly check to see if a Mixer/Divider is operating properly, proceed as follows:

a. Remove the Module from the Model 5100A and supply it with power using the fabricated connector shown in Figure 5-5.

b. Connect a 24 Mc, 1V signal to the input connector for terminal 6. Measure the frequency with an electronic counter.

c. Connect a 3.05 Mc, 60 mv signal to the input connector for terminal 2. Measure frequency with electronic counter. Supply 3.05 Mc from 606A.

d. Connect 3.5 Mc at 50 mv to input connector for terminal 1. Measure frequency with an electronic counter. Supply 3.5 Mc from Sweep Generator.

e. Observe output at connector for terminal 3 with RF Voltmeter and Electronic Counter. The output level should be at least 60 mv open circuit, and the output frequency equal to the sum of the input frequencies divided by 10.

5-51. MIXER ADJUSTMENTS. If Mixer adjustments are necessary, proceed as follows:

a. Remove the Mixer/Divider Module from the Model 5100A and connect it to its normal input with the extension connector diagrammed in Figure 5-5. Remove cover from Mixer/Divider Module.

b. Connect 24 Mc, 1V to pin 6.

c. Connect 3.05 Mc, 60 mv to pin 2 from Sweep Generator.

Note

The slugs in all the tuning coils have been set with a drop of dope. Rather than freeing all these slugs with a drop of acetone, it would be wise to compare the outputs of the various stages first, to see if the troublesome stage can be localized.

d. Connect 411A to junction of C18 and C19. Short L13 to chassis and tune L12 to peak 411A reading (20 mv to 50 mv).

e. Remove short from L13 and tune L13 to null 411A reading (18 mv to 40 mv).

f. Connect 411A to junction of C23 and C24.

g. Short L16 to chassis and tune L15 to peak 411A reading (300 mv to 700 mv).

h. Remove short from L16 and short L17. Tune L16 to null 411A reading (50 mv to 120 mv).

i. Remove short from L17 and tune L17 to peak 411A reading (130 mv to 270 mv).

j. Connect 411A to junction of C28 and C29.

k. Sweep signal at pin 2 between 2.5 Mc and 3.5 Mc. Bandwidth between -3 db points should be between 300 kc and 500 kc, centered 3.0 Mc to 3.1 Mc, with a level at band center of more than 30 mv rms. If band is not well centered, try adjusting L13 to center the bandwidth. If this fails, repeat Paragraphs 5-51b through i, with signal at pin 2 adjusted to compensate for bandwidth centering.

5-52. 30 MC FILTER ALIGNMENT. To align the 30 Mc filter (at the Divider Board input, proceed as follows:

a. Remove the Mixer/Divider Module from the Model 5100A and connect it to its normal input with the extension connector diagrammed in Figure 5-5. Remove cover from Mixer/Divider Module.

b. Set 606A to 30.50 Mc and connect through a 390-ohm resistor to junction of C61 and C62 with cable removed from junction.

c. Connect 411A to junction of C61 and C62.

d. Set 606A output level to 0.5 volt rms.

e. Short L62 to chassis and tune L61 to peak 411A indication.

f. Remove short from L62 and tune L62 to null 411A indication.

g. Set 606A output level to 60 mv.

h. Connect 411A to junction of C66 and C67.

i. Short L65 and tune L64 to peak 411A indication (200 mv to 300 mv).

j. Remove short from L65 and short L66.

k. Adjust L65 to null 411A indication (10 mv to 16 mv).

l. Remove short from L66 and short L67.

m. Adjust L66 to peak 411A indication (80 mv to 140 mv).

n. Remove short from L67 and tune L67 to null 411A indication (30 mv to 50 mv).

o. Connect 411A through 1 pf capacitor to CR51 cathode.

p. Tune T52 to peak 411A indication.

q. Connect 411A to Q53 base. Voltage should be more than 120 mv rms.

r. Vary 606A from 29.5 Mc to 31.5 Mc. Bandwidth (-3 db points referred to level at 30.5 Mc) must be at least 1.25 Mc apart, centered about 30.5 Mc. Symmetry is adjusted by L62 and/or L67 to center bandwidth.

s. Remove 606A and 390-ohm resistor from junction of C61 and C62 and reconnect cable.

t. Connect 606A to pin 2.

u. Set 606A to 3.0 Mc at 60 mv level. Leave 411A connected to Q53 base.

v. Connect 3.5 Mc, 50 mv signal to pin 1 from Sweep Generator.

w. Connect 24 Mc, 1V signal to pin 6.

x. Sweep signal at pin 1 from 2.5 Mc to 4.5 Mc. Bandwidth (-3 db points referred to level at 3.5 Mc) must be at least 1.20 Mc, centered on 3.5 Mc. Cen-

tering may be adjusted using L61. Level at band center should be more than 120 mv.

5-53. DIVIDER ADJUSTMENT. If divider adjustments are necessary, proceed as follows:

a. Remove the Mixer/Divider Module from the Model 5100A and connect it to its normal input with the extension connector diagrammed in Figure 5-5. Remove cover from Mixer/Divider Module.

b. Disconnect jumper in Q53 base circuit.

c. Set 606A to 25 Mc at a level providing 200 mv at Q53 base and connect to Q53 base.

d. Clamp oscilloscope probe to body of C78; be sure oscilloscope is not directly connected to circuit at this point.

e. Adjust L68 until oscilloscope indicates that signal is being divided by two (see Figure 5-6).

f. Vary 606A frequency from 25 Mc to 40 Mc. Division by two should occur at all frequencies between 25.0 Mc and 35.0 Mc.

g. Connect oscilloscope horizontal input to 3 Mc at A4J5 (pin 2) using a BNC "T". The oscilloscope probe remains clamped around the body of C78. Set oscilloscope controls so a Lissajous pattern may be observed.

h. Set 606A to 28.5 Mc. Adjust L70 until a 5-to-1 Lissajous pattern is observed.

i. Sweep 606A frequency from 26 Mc to 34 Mc. Division by 5 should occur at any frequency between 29 Mc and 32 Mc.

j. Remove oscilloscope probe from C78.

k. Disconnect 606A from Q53 base and replace jumper in Q53 base circuit.

l. Connect 606A to pin 2.

m. Set 606A to 3.0 Mc at 60 mv.

n. Connect 3.0 Mc, 50 mv signal to pin 1 from Sweep Generator.

o. Connect 24 Mc, 1V signal to pin 6.

p. Connect 411A to pin 3.

q. Sweep signal at pin 1 between 3.0 Mc and 4 Mc.

r. Check level of output (pin 3) signal when signal at pin 1 is 3.0 Mc, 3.5 Mc, and 4.0 Mc. Levels should be within 12 mv of each other, centered from 35 mv to 60 mv.

5-54. MIXER/FILTER A12.

5-55. NORMAL OPERATION. The first mixing stage combines the 1V 24 Mc signal at pin 6 and the 60 mv

3.0 Mc to 3.1 Mc signal at Pin 2. The sum of these two signals (27.0 Mc to 27.1 Mc) is added to the 50 mv 3 to 4 Mc signal at Pin 1, and the sum of these (30 Mc to 31 Mc) is filtered and amplified to provide an output of 150 mv at Pin 5.

5-56. OPERATIONAL CHECKS. To quickly check to see if the Mixer/Filter is operating properly, proceed as follows:

a. Remove the Module from the Model 5100A and supply it with power using the fabricated connector as shown in Figure 5-5.

b. Connect a 24 Mc, 1V signal to the input connector for terminal 6. Measure frequency with an electronic counter.

c. Connect a 3.05 Mc, 60 mv signal to the input connector for terminal 2. Measure frequency with an electronic counter. Supply 3.05 Mc from 606A.

d. Connect 3.5 Mc at 50 mv to input connector for terminal 1. Measure frequency with an electronic counter. Supply 3.5 Mc from Sweep Generator.

e. Observe output at BNC connector for terminal 5 with RF Voltmeter and Electronic Counter. The output level should be 150 mv, and the output frequency equal to the sum of the input frequencies.

5-57. MIXER ADJUSTMENTS. This Mixer is identical to those in A5-A11. Use the procedure of Paragraph 5-51 for Mixer adjustments.

5-58. 30 MC FILTER ALIGNMENT. To align the 30 Mc filter (at the Filter Board input), proceed as follows:

a. Connect 606A through a 390-ohm resistor to junction of A2C61 and A2C62.

b. Set 606A to 30.50 Mc, output level to 0.5V rms.

c. Connect 411A to junction of A2C61 and A2C62.

d. Short L62 to chassis and tune L61 to peak 411A indication.

e. Remove short from L62 and tune L62 to null 411A indication.

f. Set 606A output level to 60 mv.

g. Connect 411A to junction of C66 and C67.

h. Short L65 and tune L64 to peak 411A indication (200 mv to 300 mv).

i. Remove short from L65 and short L66. Tune L65 to null 411A indication (10 mv to 16 mv).

j. Remove short from L66 and short L67. Tune L66 to peak 411A indication (80 mv to 140 mv).

k. Remove short from L67 and tune L67 to null 411A indication (30 mv to 50 mv).

l. Connect 411A to Q53 base.

m. Tune T51 to peak 411A reading. Level should be more than 130 mv rms.

o. Connect a "T" with a 50-ohm load to 411A input.

p. Connect 411A to pin 5 (30-31 Mc output, 150 mv level).

q. Tune L68 to peak 411A reading.

r. Adjust R64 to set output level at 150 mv rms.

s. Connect 411A to Q53 base. Remove 50-ohm load.

t. Vary 606A from 29.5 Mc to 31.5 Mc. Bandwidth (-3 db points referred from 30.5 Mc level) should be at least 1.25 Mc, centered on 30.5 Mc. Adjust L62 and/or L67 slightly, as necessary to center bandwidth.

u. Remove 606A and 390-ohm resistor from junction of C61 and C62.

v. Connect 606A to pin 2.

w. Set 606A to 3.0 Mc at 60 mv.

x. Connect 3.5 Mc, 50 mv signal to Pin 1 from Sweep Generator.

y. Connect 24 Mc, 1V signal to Pin 6.

z. Sweep signal at Pin 1 from 2.5 Mc to 4.5 Mc. The bandwidth (-3 db points referred from 3.5 Mc input) should be at least 1.2 Mc apart and centered on 3.5 Mc. L61 should be readjusted, if necessary, to improve centering. Level at band center should be more than 120 mv rms.

aa. Connect "T" with 50-ohm load to 411A input.

ab. Connect 411A to Pin 5 (30-31 Mc output, 150 mv level).

ac. Set signal at Pin 1 to 3.5 Mc, 50 mv.

ad. Adjust R64 to set output level to 150 mv.

ae. Sweep Pin 1 signal between 2.5 Mc and 4.5 Mc. Level between 3.0 Mc and 4.0 Mc should not vary more than 0.5 db. If level varies more than 0.5 db, retune L68 with Pin 1 signal at 3.5 Mc, and reset R64 for 150 mv output. Then repeat the check in this paragraph.

5-60. MULTIPLIERS A13-A18.

5-61. NORMAL OPERATION. Input frequencies are 33 Mc, 35 Mc, 37 Mc, 38 Mc, and 39 Mc at levels of about 90 mv. Output frequencies are 350 Mc, 360 Mc, 370 Mc, 380 Mc, and 390 Mc at 1.5 volts and 330 Mc at 1.2 volts. The "on/off" ratio of A13 thru A17 is greater than 75 db.

5-62. **OPERATION CHECK.** To quickly check to see if the multipliers are operating properly, proceed as follows:

a. For example, if Multiplier A13 is being checked, swing out UHF deck as indicated in Paragraph 5-16.

b. Disconnect 39 Mc cable to A13 input (see Figure 5-9) and connect 39 Mc from an $\text{C}\phi$ 5110A.

c. Punch the "0" button in the most significant column (the first column from the left on the front panel of the 5100A). This applies control voltage to Multiplier A13.

d. Disconnect cable marked "390 Mc" which connects FL1 to 350 to 390 Switch A20. Connect Electronic Counter and RF Millivoltmeter to output of FL1.

e. Frequency should be 390 Mc at $300 \text{ mv} \pm 50 \text{ mv}$.

f. Multipliers A14-A18 may be checked in a similar manner, using appropriate input frequencies and front panel pushbuttons. A18 is always on so a front panel button need not be pushed to supply it with power. Connect 3 db pad ($\text{C}\phi$ 355C) in 39 Mc cable between $\text{C}\phi$ 5110A and $\text{C}\phi$ 5100A. Output from A13 should drop no more than 2 db. Check other Multipliers in a similar manner.

5-63. **ADJUSTMENTS.** If Multiplier adjustments are necessary, proceed as follows:

Note

The output voltage level of the UHF Multipliers A13 to A17 is adjusted to $350 \text{ mv} \pm 1 \text{ db}$. Multiplier A18 output is adjusted to $420 \text{ mv} \pm 1 \text{ db}$. Before making any adjustments, check output voltage level of all Multipliers to find average level with $\text{C}\phi$ 411A. Only adjust output voltage level on Multipliers which are more than $\pm 1 \text{ db}$ from the average level. Use the average level as the true voltage for the $\text{C}\phi$ 411A if the accuracy of the $\text{C}\phi$ 411A is unknown. (See step h.)

a. Remove Multiplier Module from UHF swing-out deck. This will require removing two screws, disconnecting input cable and output Filter, and unsoldering +6.3 volt, -12.6 volt, and -12.6 volt control leads (except for A18 which has no -12.6 volt control).

b. Once the Module is on the bench with tuning holes exposed, reconnect and resolder all connections.

c. If the Module that is being adjusted is A13, punch the "0" pushbutton in the 10^7 column on front panel of 5100A. This applies -12.6 volt control voltage to A13 and turns the Multiplier circuits on.

d. Remove cable marked "390 Mc" which connects output of FL1 and 350 to 390 Mc Switch A20 (see Figure 5-9).

e. Connect RF Millivoltmeter with Tee Probe ($\text{C}\phi$ 11024A) and a 50 ohm termination ($\text{C}\phi$ 908A) to output of FL1.

f. Use drop of acetone to loosen slug in L8 (see Figure 5-19) and tune for maximum.

g. Tune L2, C9, C18, C24, and C25 in this order for maximum output.

i. Remove -12.6 volt control from Multiplier A13 by returning "0" pushbutton in 10^7 column to its original position. Output reading should drop to zero.

h. R15 can be adjusted if output voltage level of one Multiplier is more than $\pm 1 \text{ db}$ from the average value. The db scale on the $\text{C}\phi$ 411A will indicate 350 mv is +4 db and 420 mv is +6 db. A 2 db difference in voltage level between A18 and the average of the other 5 Multipliers can be used to set a reference for all 6 Multipliers.

5-64. 30 TO 39 MC SWITCH MODULE A19.

5-65. **NORMAL OPERATION.** The 30 to 39 Mc Switch Module contains 10 diode switch matrices, corresponding to the 10 front panel pushbuttons in the 10^6 column. One switch matrix is turned "on" by applying a -12.6 volt enabling voltage from a LOCAL or REMOTE source as selected by the front panel FREQUENCY SELECTION switch. Each pushbutton in the 10^6 column represents an input and an output from A19. Insertion loss of the switch matrices is typically less than 3 db, and the "on/off" ratio greater than 108 db.

5-66. **OPERATIONAL CHECKS.** On-off switching action and switching time of the 30 to 39 Mc Switch Assemblies are tested using the procedures of Item 2 of the In-cabinet Performance Check, Table 5-2. The test below for insertion loss may be helpful in checking for a switch with marginal performance.

5-67. Insertion loss is the measure of switch conduction when the switch is "on", comparing the output signal to the input signal, with the input signal as 0 db reference.

5-68. The inputs to the 30 to 39 Mc Switch Module are J1 thru J10, corresponding to the pushbuttons in the 10^6 column. Output of the 30 to 39 Mc Switch is J18. J11 through J15, and J17 are 100 ohm outputs to the Multipliers.

5-69. To measure insertion loss, connect the input of the desired switch through a BNC "T". Connect another BNC "T" to J18. Load appropriate output to Multiplier with 100 ohms. Using the appropriate front panel pushbutton or remote programming, turn the switch "on". Measure the input on an $\text{C}\phi$ 411A RF Millivoltmeter (use db scale). Measure the output with the RF Millivoltmeter. The difference in db readings is the insertion loss of that switch matrix. Insertion loss is normally 1.6 db, $\pm 1 \text{ db}$.

5-70. 350 TO 390 MC SWITCH A20.

5-71. NORMAL OPERATION. The 350 to 390 Mc Switch contains 5 diode switches, corresponding to the 5 front panel pushbuttons in the 10⁷ column. One diode switch is turned "on" by applying a -12.6 volt enabling voltage from a LOCAL or REMOTE source as selected by the front panel FREQUENCY SELECTION switch. Each pushbutton in the 10⁷ column represents an input and output from A20. Insertion loss of the switches is typically less than 1 db, and the "on/off" ratio greater than 25 db.

5-72. OPERATIONAL CHECKS. On-off switching action and switching time of the 350 to 390 Mc Switch are tested using the procedure of Item 2 of the In-cabinet Performance Check, Table 5-2. The test below for insertion loss may be helpful in checking for a switch with marginal performance.

5-73. Insertion loss is the measure of switch conduction when the switch is "on", comparing the output signal to the input signal, with the input signal as 0 db reference.

5-74. The inputs to the 350 to 390 Mc Switch Module are J1 thru J5, corresponding to the pushbuttons in the 10⁷ column. Output of the 350 to 390 Mc switch is J6.

5-75. To measure insertion loss, swing out UHF deck (see Figure 5-9) and connect the input of the desired switch through a BNC "T". Connect another BNC "T" to J6. Using the appropriate front panel pushbutton, or remote programming, turn the switch "on". Measure the input with an $\frac{1}{2}$ 411A RF Millivoltmeter (use db scale). Measure the output with the RF Millivoltmeter. The difference in db readings is the insertion loss of that diode switch. Insertion is normally less than 1 db.

5-76. 1ST UHF MIXER A21.

5-77. NORMAL OPERATION. Inputs are 330 Mc at 420 mv from FL6, and 30 to 31 Mc at 100-165 mv from Mixer/Filter A12 through Connector Block A4. Output is 360 to 361 Mc at 450 mv.

5-78. OPERATIONAL CHECK. The 1st UHF Mixer is indirectly checked by proper operation of the 5100A in the In-Cabinet Performance Check, Table 5-2.

5-79. ADJUSTMENTS. If adjustments to the 1st UHF Mixer are necessary, proceed as follows:

Note

Adjustments in the Mixer are extremely critical, particularly the adjustment of R3 which adjusts the bias on the Mixer diodes CR1 and CR2. A misadjustment here will cause spurious signals to exist on the output frequencies of the 5100A.

- Connect 330 Mc from FL6 to J2.
- Connect a Sweep Signal Generator with output on -12 db and centered around 30.5 Mc to J1.
- Connect a BNC "T" to output of Filter FL7.

d. Monitor output signal with a 185B Sampling Oscilloscope.

e. Sweep input signal between 30 and 31 Mc.

f. A2C1, A2C4, and A2C6 are adjusted for maximum output.

g. A1C2 and A1C7 are adjusted to provide equal amplitude of response curve at 360 and 361 Mc.

h. A2C6 is also adjusted to provide equal band-edges.

i. A1R3 is adjusted to -2.2 volts at the junction of A1C4 and A1R7.

5-80. 2ND UHF MIXER A22.

5-81. NORMAL OPERATION. Inputs are 360 to 361 Mc at 250 to 350 mv from FL7, 30 to 39 Mc at 90 mv from A19, and Automatic Gain Control from A24. Output is 390 to 400 Mc at 410 mv.

5-82. OPERATIONAL CHECK. The 2nd UHF Mixer is indirectly checked by proper operation of the 5100A in the In-Cabinet Performance Check, Table 5-2.

5-83. ADJUSTMENTS. If adjustments to the 2nd UHF Mixer are necessary, proceed as follows:

Note

Adjustments in the Mixer are extremely critical, particularly adjustment of R8 which adjusts bias on Mixer diodes CR1 and CR2. Misadjustment here will cause spurious signals to the output frequencies of the 5100A.

- Connect 360 to 361 Mc from FL7 to J2.
- Connect a Sweep Signal Generator with output on -12 db and centered around 35 Mc to J1.
- Connect a BNC "T" to output of Filter FL8.
- Monitor output signal with a 185B Sampling Oscilloscope.
- Sweep input signal between 30 and 35 Mc.
- A2C1, A2C4, A2C6, and A2C9 are stagger tuned to provide equal amplitude over the band.
- A1L3 and A1L5 are adjusted to provide equal amplitude at band edges 390 and 400 Mc.
- A2C9 is also adjusted to provide equal amplitude at 390 and 400 Mc.
- A1R8 is adjusted to -1.8 volts at the junction of A1R11 and A1C7.

5-84. The following procedure is recommended as a performance check after the instrument has been in the field for a long time or whenever the 2nd UHF Mixer is replaced.

a. Disconnect AGC lead to 2nd Mixer and connect a 6200 ohm, 5%, 1/2W resistor (clips on each lead) between the AGC terminal and the +6.3V terminal. This resistor will set the AGC current to about 1 ma.

b. Connect a 2 db pad ($\frac{1}{2}$ 355C) in 360-361 Mc cable between FL7 360 Mc Filter and J2 of 2nd Mixer.

c. Connect a 3 db pad ($\frac{1}{2}$ 355C) in 30 Mc cable between $\frac{1}{2}$ 5100A and $\frac{1}{2}$ 5110A. Connect another 3 db pad in 39 Mc cable between $\frac{1}{2}$ 5100A and $\frac{1}{2}$ 5110A.

d. Connect an ϕ 411A with Tee Probe (ϕ 11024A) and a 50-ohm termination (ϕ 908A) to the output of FL8 395 Mc Filter.

e. Using a plastic tuning wand adjust 2nd Mixer output tuning C9 to make output equal and maximized for two frequencies of 40,000,000.00 and 49,000,000.00 cps. The output from 395 Mc Filter should be greater than 55 mv.

f. Remove pads and current setting resistor and restore to normal. Solder AGC lead and replace plug on C9 adjustment hole.

5-85. 3RD UHF MIXER A23.

5-86. NORMAL OPERATION. Inputs are 390 to 400 Mc at 55 mv from FL8, and 350 to 390 Mc at 350 mv from A20. Output is 0 to 50 Mc greater than 30 mv.

5-87. OPERATIONAL CHECK. The 3rd UHF Mixer is indirectly checked by proper operation of the 5100A in the In-Cabinet Performance Check, Table 5-2.

5-88. OUTPUT AMPLIFIER A24.

5-89. NORMAL OPERATION. Inputs are 0 to 50 Mc at 55 mv from A23, and three AND gate control voltages from the "0" pushbuttons in the 10^5 , 10^6 , and 10^7 columns on front panel of 5100A. Outputs are 0 to 50 cps greater than 55 mv, signal for CIRCUIT CHECK meter, 50 cps to 50 Mc at 1 volt, and Automatic Gain Control to 2nd UHF Mixer A22.

5-90. OPERATIONAL CHECK. The output Amplifier circuits are checked indirectly by proper operation of the 5100A in the In-cabinet Performance Check, Table 5-2.

5-91. ADJUSTMENTS. The following procedure is recommended when an In-cabinet Performance Check indicates the Amplifier A24 requires adjustment or whenever the Amplifier is replaced.

a. Set pushbuttons for a frequency of 00,099,000.00 cps.

b. Check dc voltage level at LO LEVEL OUTPUT jack on rear panel. If voltage level is greater than ± 2 mv, then adjust R1 (DC ADJ LO LEVEL OUTPUT on A24) to obtain a dc voltage level of 0V ± 2 mv.

c. Connect ϕ 411A with Tee Probe and 50 ohm termination to OUTPUT jack on front panel.

d. Check output voltage at frequencies of 500 Kc and 49 Mc. Adjust OUTPUT LEVEL R56 to obtain an output reading within 1V ± 1 db at 500 kc and 49 Mc. Take calibration of ϕ 411A into account.

e. Check output voltage level for 99 kc and 100 kc. Adjust R61 OUTPUT LEVEL MANUAL OPERATION control to obtain same output voltage for both frequencies. NOTE: 100 kc is below lower limit of ϕ 411A, since the fixed gain of the amplifier below 100 kc is being adjusted to be the same as at 100 kc.

f. Check the AGC amplifier section of A24 by selecting a frequency of 100 kc and inserting a 10 db pad (ϕ 355C) between the output of FL8 395 Mc Filter (output of 2nd UHF Mixer A22) and input to 3rd UHF Mixer A23. Output voltage should be down less than 1 db.

5-92. POWER SUPPLY A25.

5-93. NORMAL OPERATION. The Power Supply furnishes +6.3 volts ± 100 mv, and -12.6 volts, ± 200 mv, to all circuits in the ϕ 5100A.

5-94. OPERATIONAL CHECK. The Power Supply circuits are checked indirectly by proper operation of the 5100A in the In-cabinet Performance Checks, Table 5-2.

5-95. ADJUSTMENTS. If adjustments to the Power Supply are necessary, proceed as follows:

a. Remove bottom cover and three screws at rear of instrument. Release captive screws to swing UHF deck out.

b. Connect ϕ 740A DC Voltmeter to the -12.6V terminal (violet wire) on the bottom of the Search Oscillator Module A2. Voltmeter should read -12.600V dc, ± 200 mv. If voltage is outside this range, adjust R14. Since R14 is a wire-wound resistor, discrete voltage steps of approximately 6 mv will be observed. Adjust R14 to a stable setting on one of these steps within ± 10 mv of the required voltage.

c. Connect Voltmeter to the +6.3V terminal (red wire) on bottom of the Search Oscillator Module A2. Voltmeter should read +6.300V dc ± 100 mv. If voltage is outside this range, adjust R12. Discrete voltage steps will be observed as R14 is adjusted so leave the control set on a stable step within ± 10 mv of the required voltage. The +6.3V dc supply uses the -12.6 vdc supply as a reference and so it should be adjusted after the -12.6V dc supply.

d. Vary the line voltage quickly from 103 to 127V dc (207 to 255V dc). The instantaneous change in +6.3V dc or -12.6V dc should be less than 100 microvolts. The ϕ 740A DC Standard/Differential Voltmeter is an ideal instrument for this measurement.

e. The measurement of 60 and 120 cps ripple on the two supplies requires a special amplifier (30 db, 50 to 150 cps, noise referred to input less than 1 microvolt) and an ϕ 302A Wave Analyzer. Ripple is under 10 microvolt rms. However, ground loops between the Synthesizer and the measuring equipment will usually make this voltage level difficult to measure. Should this measurement be attempted, bear in mind that a high ripple voltage will most likely be caused by the method and equipment used, rather than the power supply.

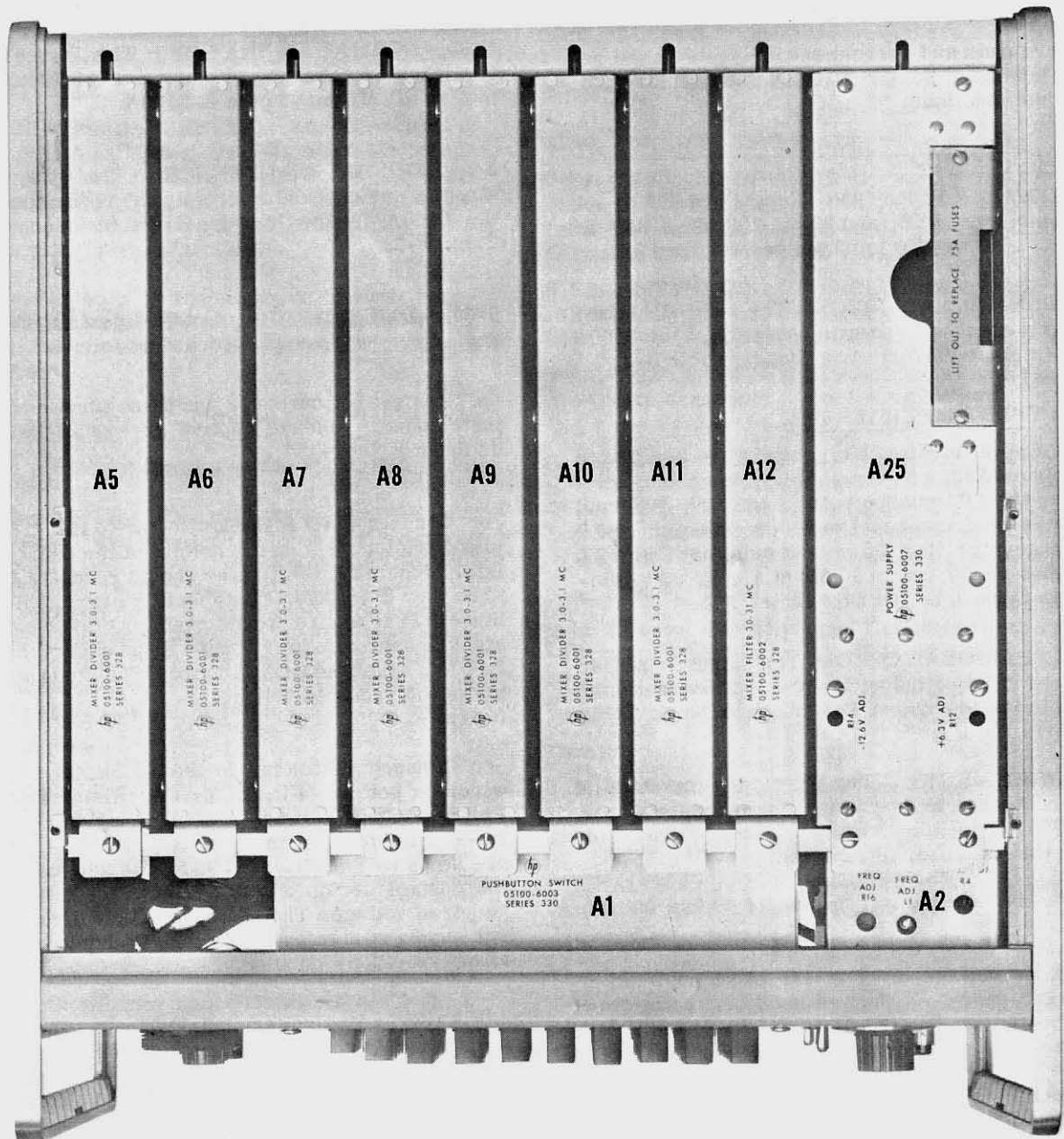


Figure 5-7. Component Location - Top View

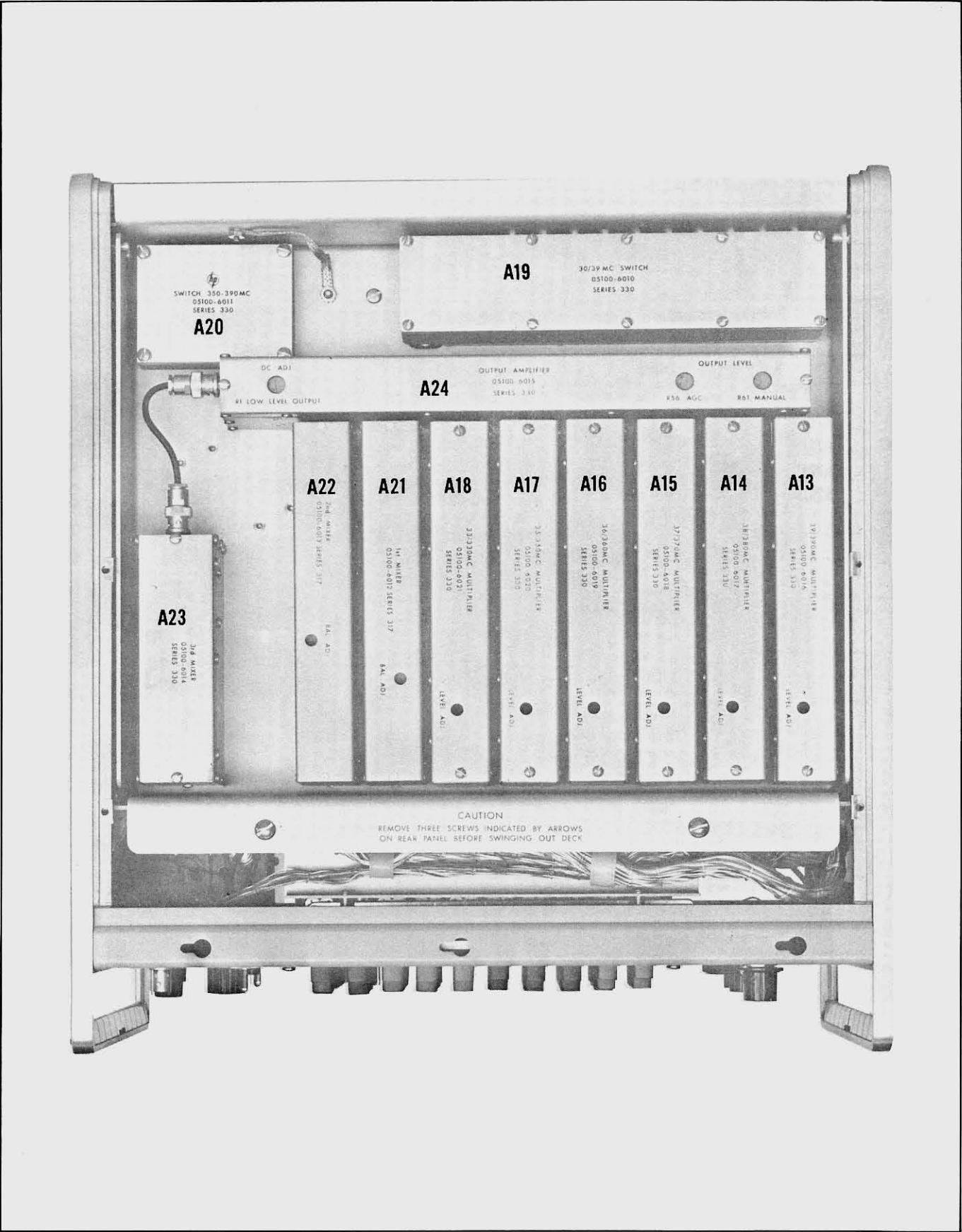


Figure 5-8. Component Location - Bottom View

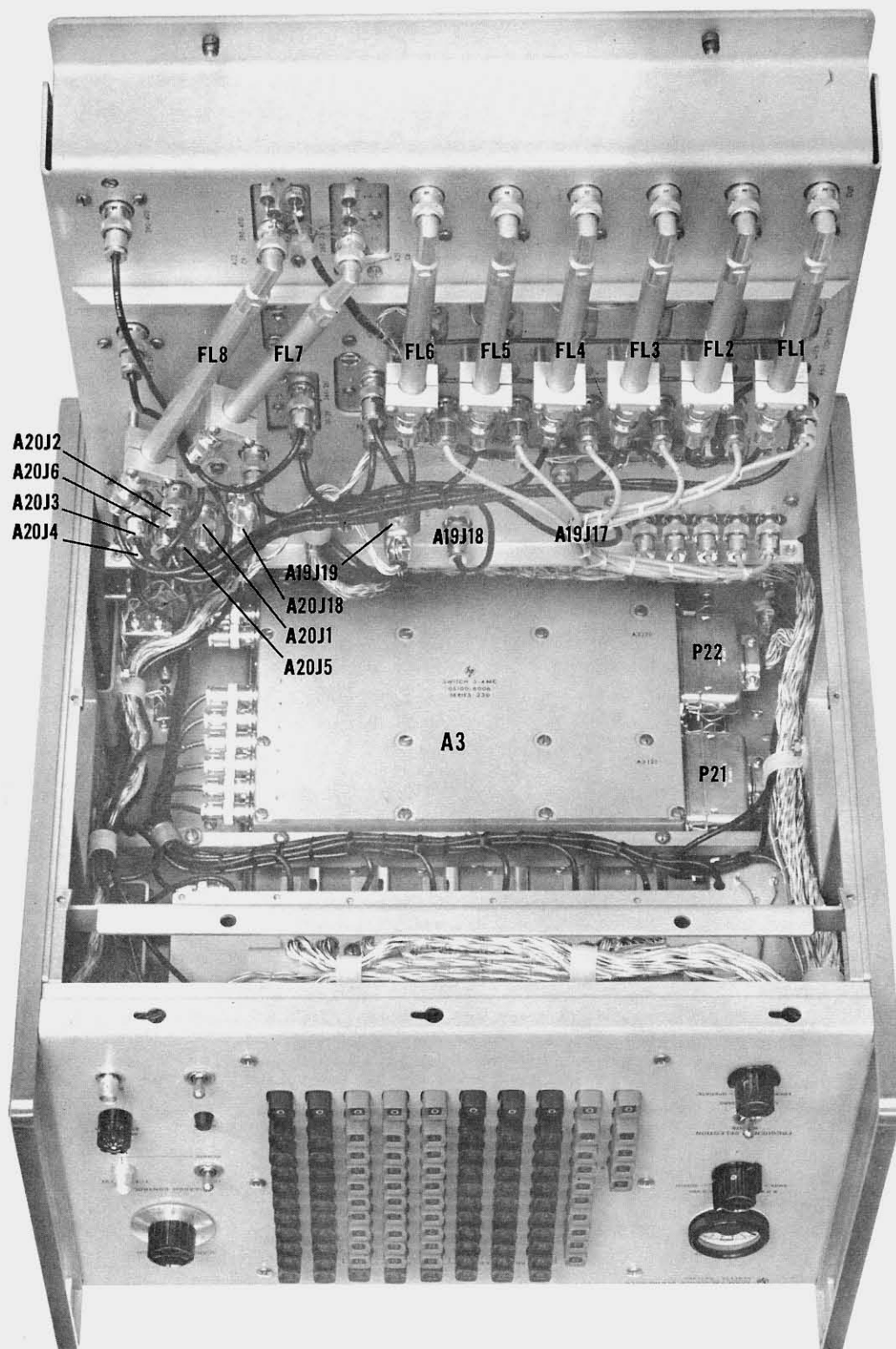


Figure 5-9. Component Location - UHF Deck Swung Out

PERFORMANCE CHECK TEST CARD

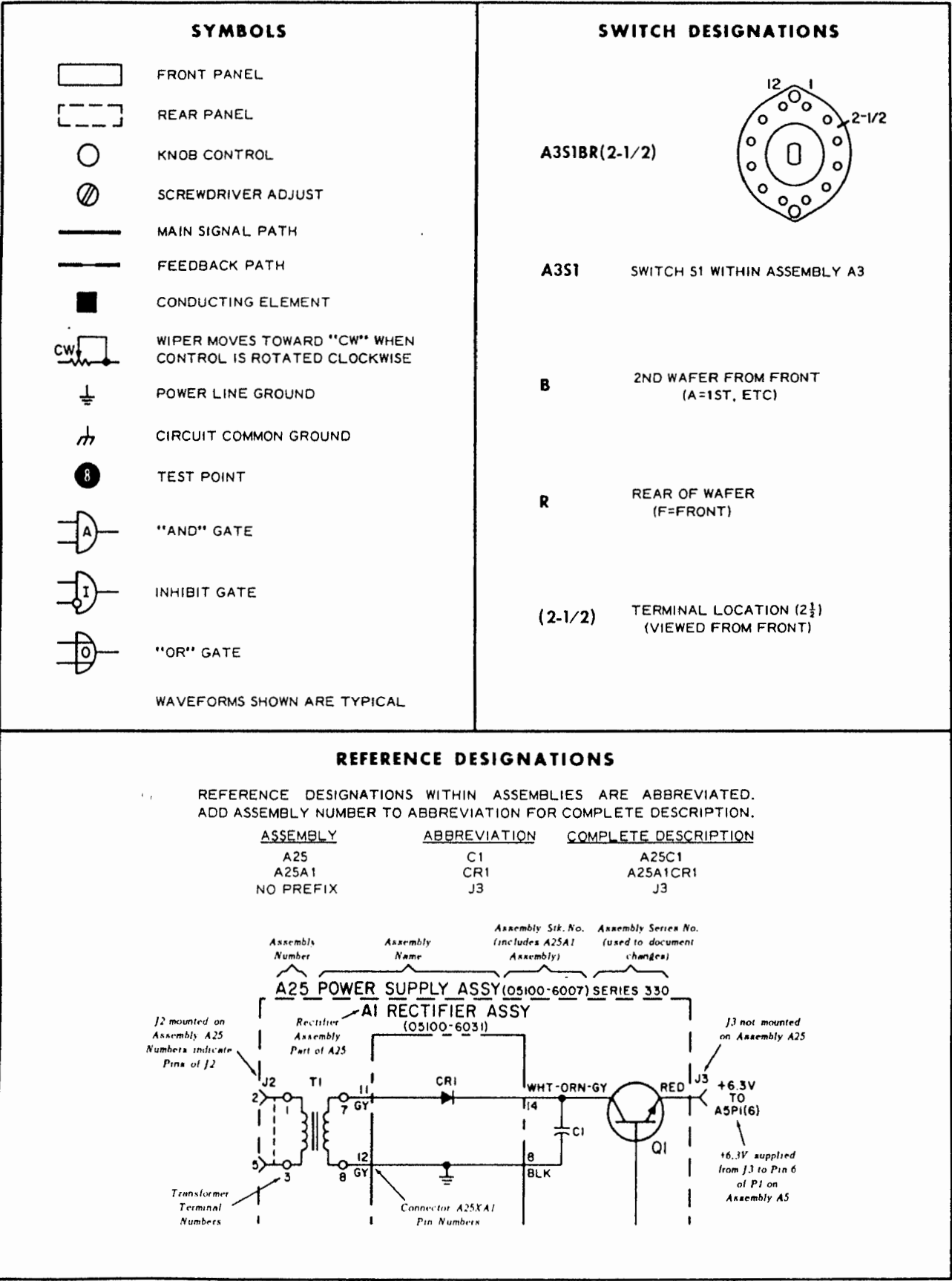
Hewlett-Packard Model 5100A

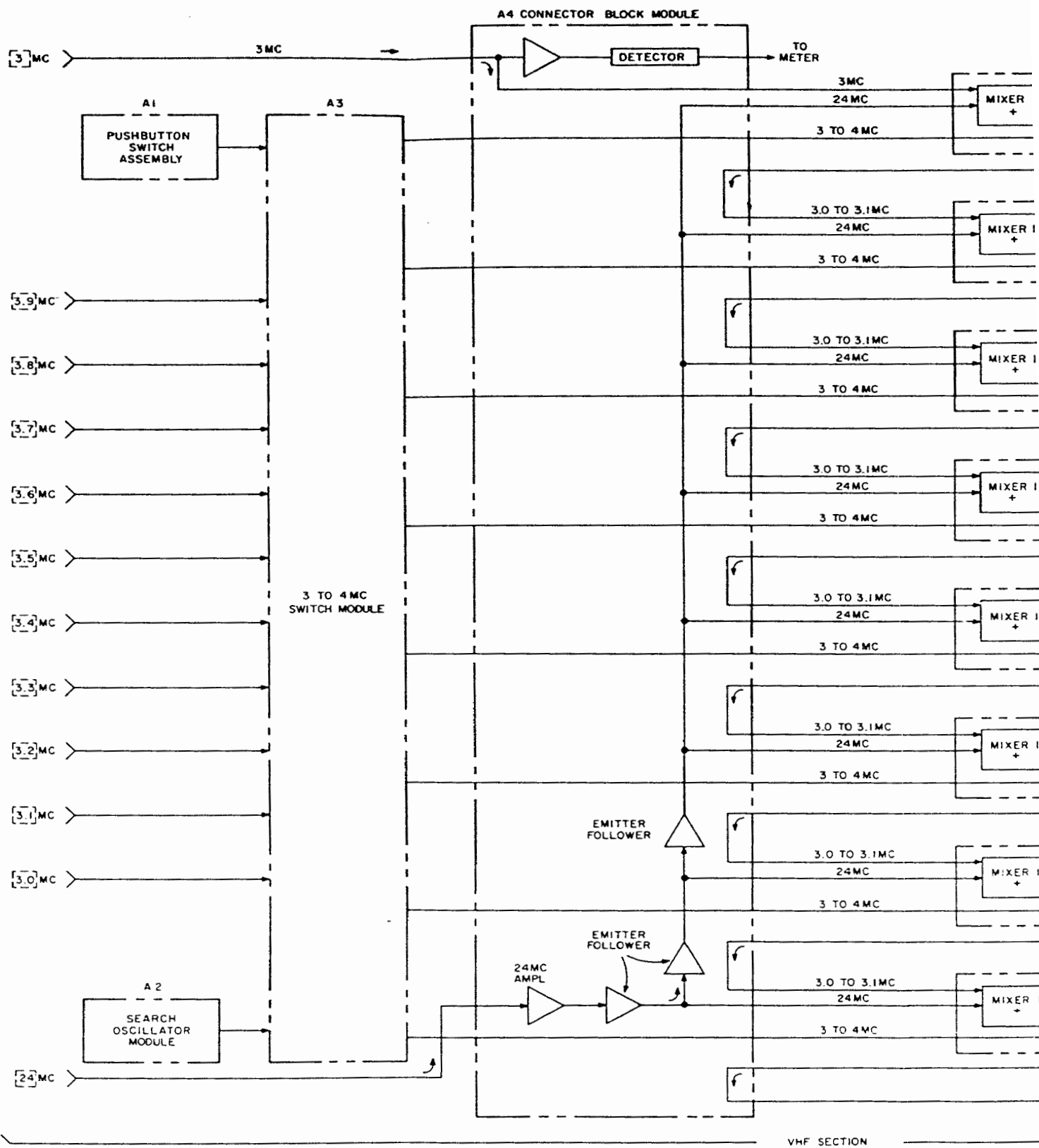
Tested by _____

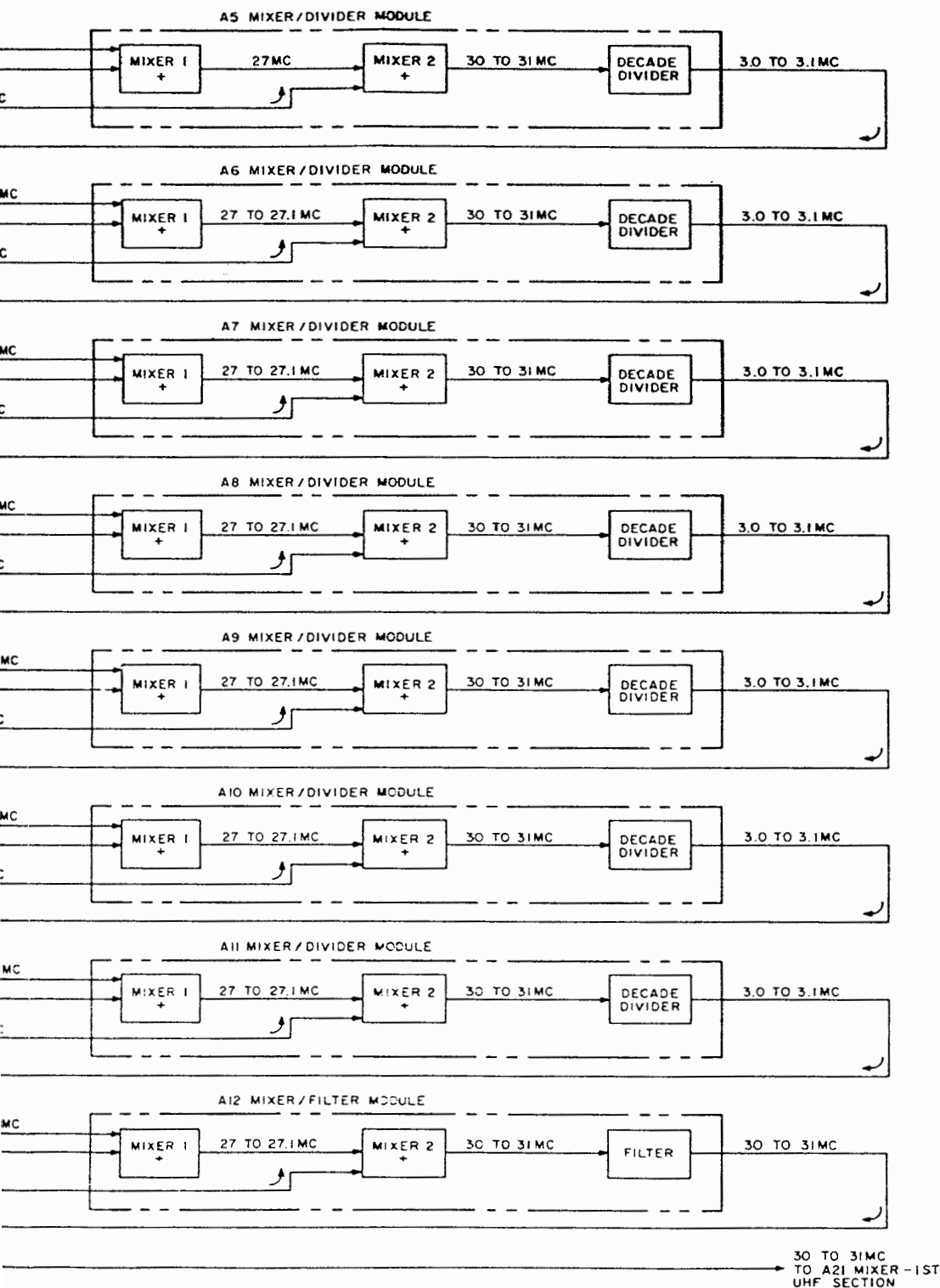
Serial Prefix No. _____ - _____

Date _____

Description	Check
1. Output frequencies Dc to 50 Mc	<input type="text"/>
2. Digital Frequency Selection 0.01 cps through 10 Mc per step	<input type="text"/>
3. Output Voltage Dc to 100 Kc >15 mv rms open circuit 50 cps to 100 kc, 1 volt rms + 2 db - 4 db 100 kc to 50 Mc, 1 volt rms ± 1 db	Lo Level Output <input type="text"/> mv -4 db <input type="text"/> + 2 db -1 db <input type="text"/> + 1 db
4. Search Oscillator Continuously variable 0.1 cps thru 1 Mc Linearity ± 5%	Manual <input type="text"/> Ext -1 to -11V <input type="text"/> Linearity -5% <input type="text"/> +5%
5. Signal-to-Phase Noise Ratio >54 db in a 30-kc band	<input type="text"/> >54 db
6. Signal-to-Am Noise Ratio >74 db in a 30 kc band above 100 kc	<input type="text"/> >74 db
7. RMS fraction frequency deviations	<input type="text"/> See Table 5-2
8. Spurious signals non-harmonically related signals below selected frequency > 90 db	<input type="text"/> >90 db
9. Harmonic signals 30 db below selected frequency	<input type="text"/> >30 db

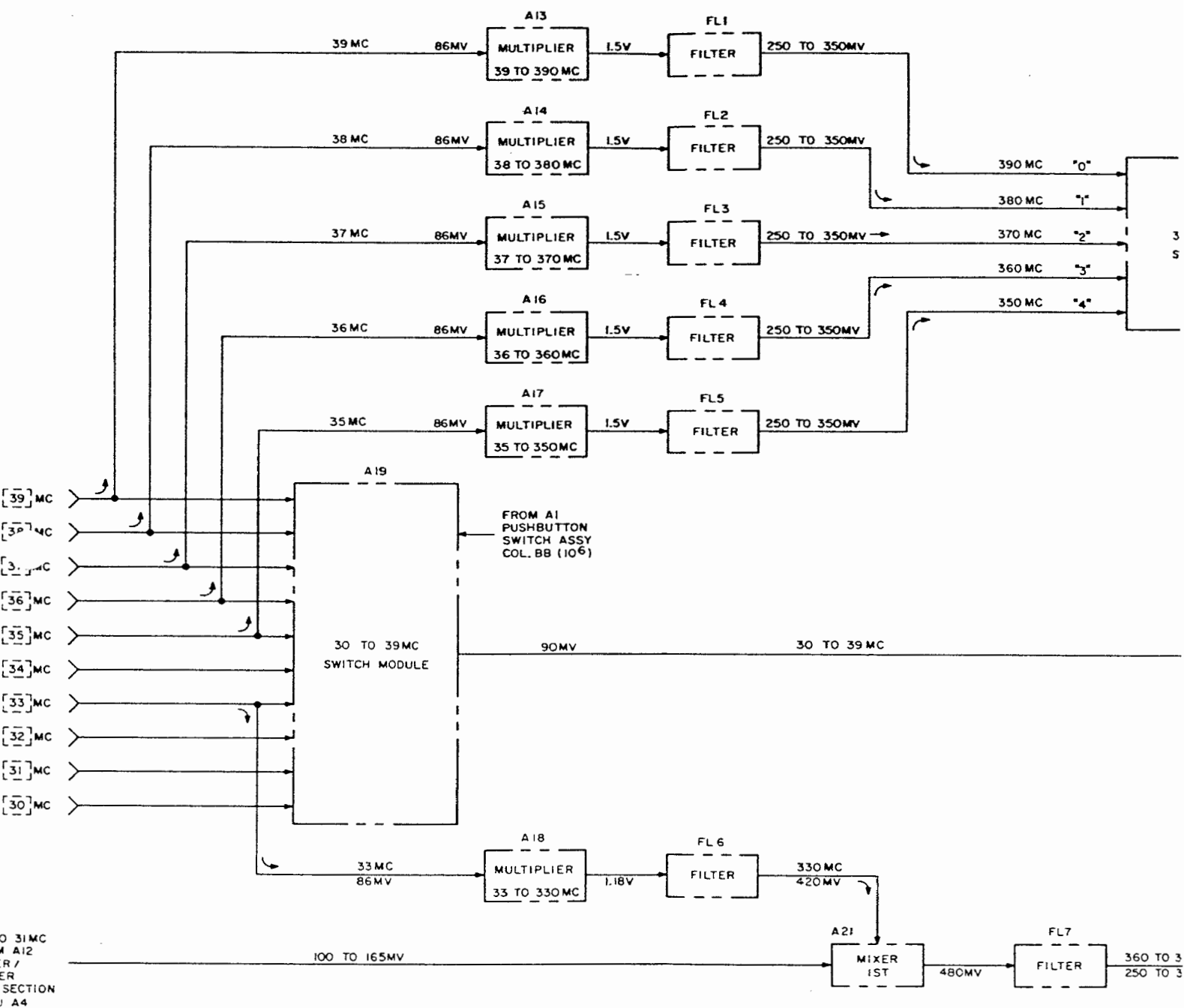






05100-D-26

Figure 5-11. Block Diagram, HF Section
5-25/5-26



UHF SECTION

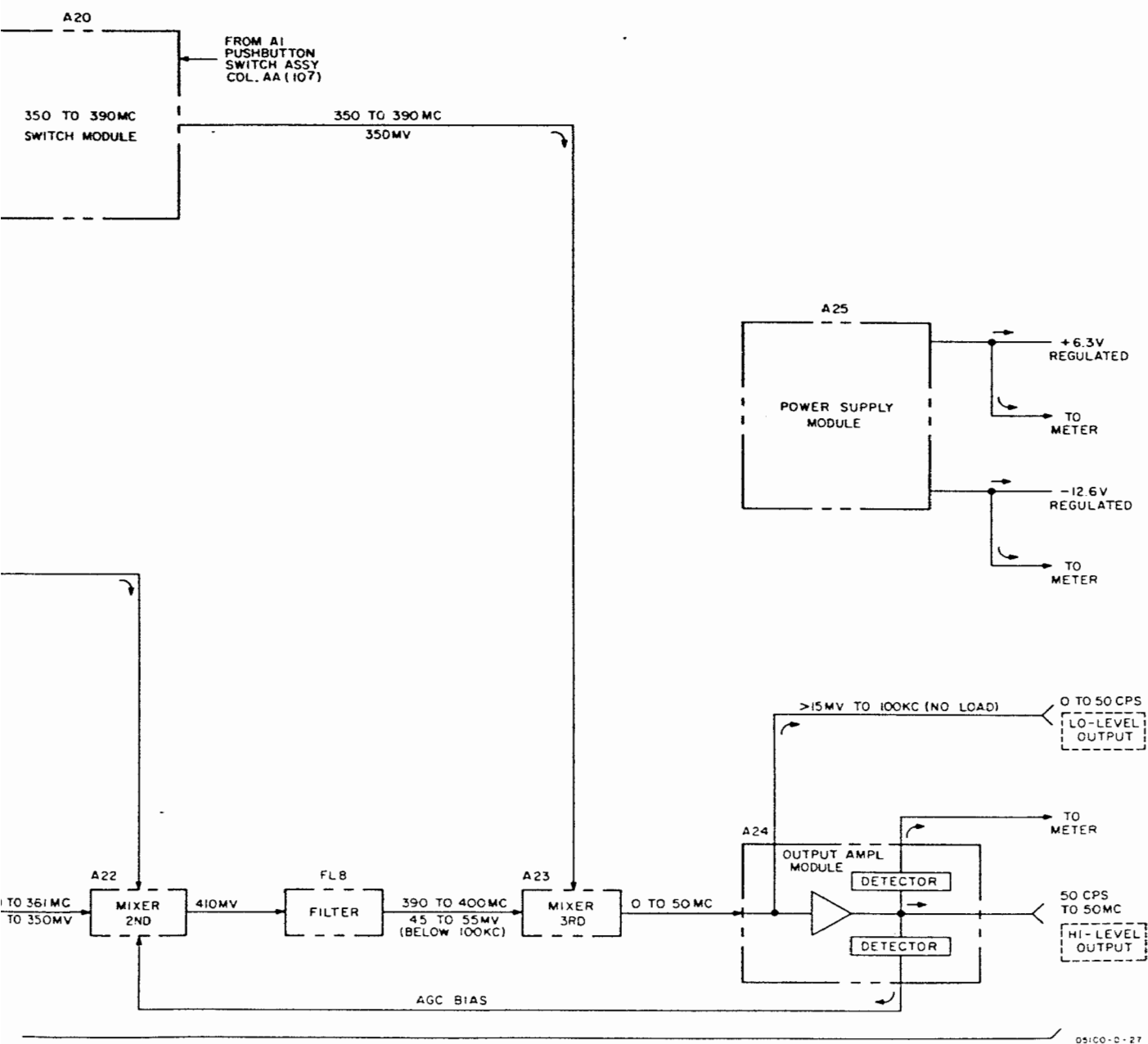


Figure 5-12. Block Diagram, UHF Section
5-27/5-

A1										ROW
KILOCYCLES				CYCLES						
	S	S	S	S	S	S	S	S	S	5
	9	9	9	9	9	9	9	9	9	9
	8	8	8	8	8	8	8	8	8	8
	7	7	7	7	7	7	7	7	7	7
	6	6	6	6	6	6	6	6	6	6
	5	5	5	5	5	5	5	5	5	5
	4	4	4	4	4	4	4	4	4	4
	3	3	3	3	3	3	3	3	3	3
	2	2	2	2	2	2	2	2	2	2
	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	0	0	0	0	0	0
COLUMN PS	AA 10 ⁷	BB 10 ⁶	CC 10 ⁵	DD 10 ⁴	EE 10 ³	FF 10 ²	GG 10 ¹	HH 10 ⁰	JJ 10 ⁻¹	KK 10 ⁻²

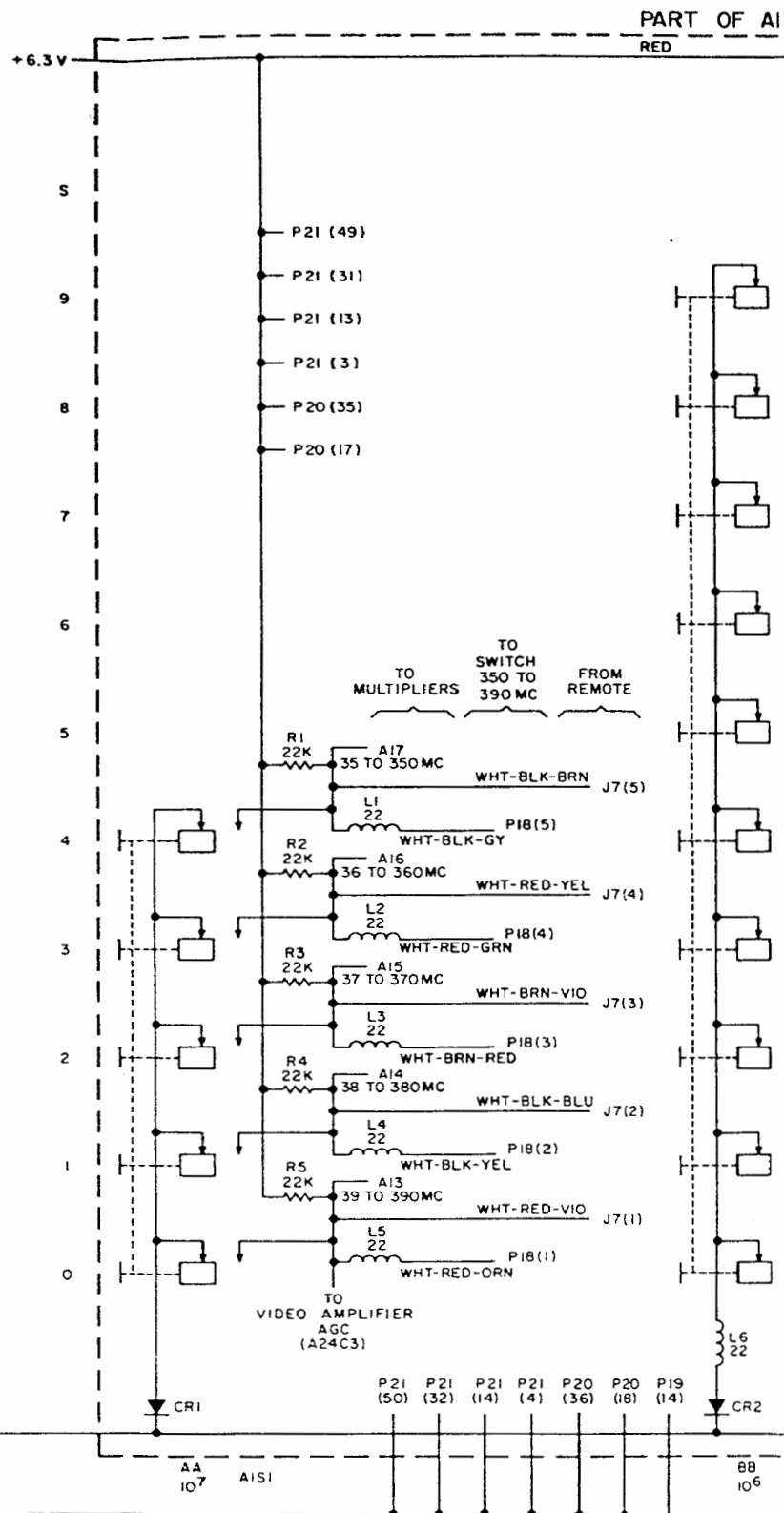
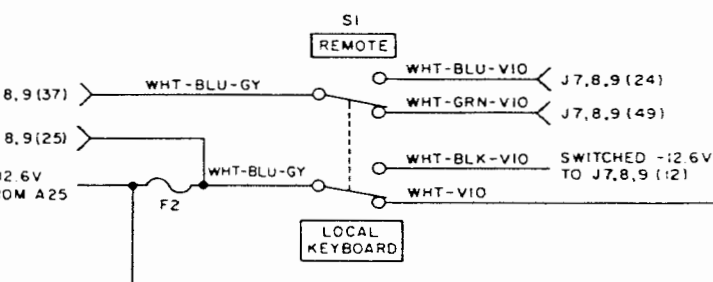
NOTES

- UNLESS OTHERWISE INDICATED:
RESISTANCE IN OHMS;
CAPACITANCE IN PICOFARADS
INDUCTANCE IN MICROHENRIES

REFERENCE DESIGNATIONS

NO PREFIX	A1
F2	C1 CR1-10
S1	L1-14 R1-15

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OF A1 PUSHBUTTON SWITCH ASSEMBLY 105100-6003)

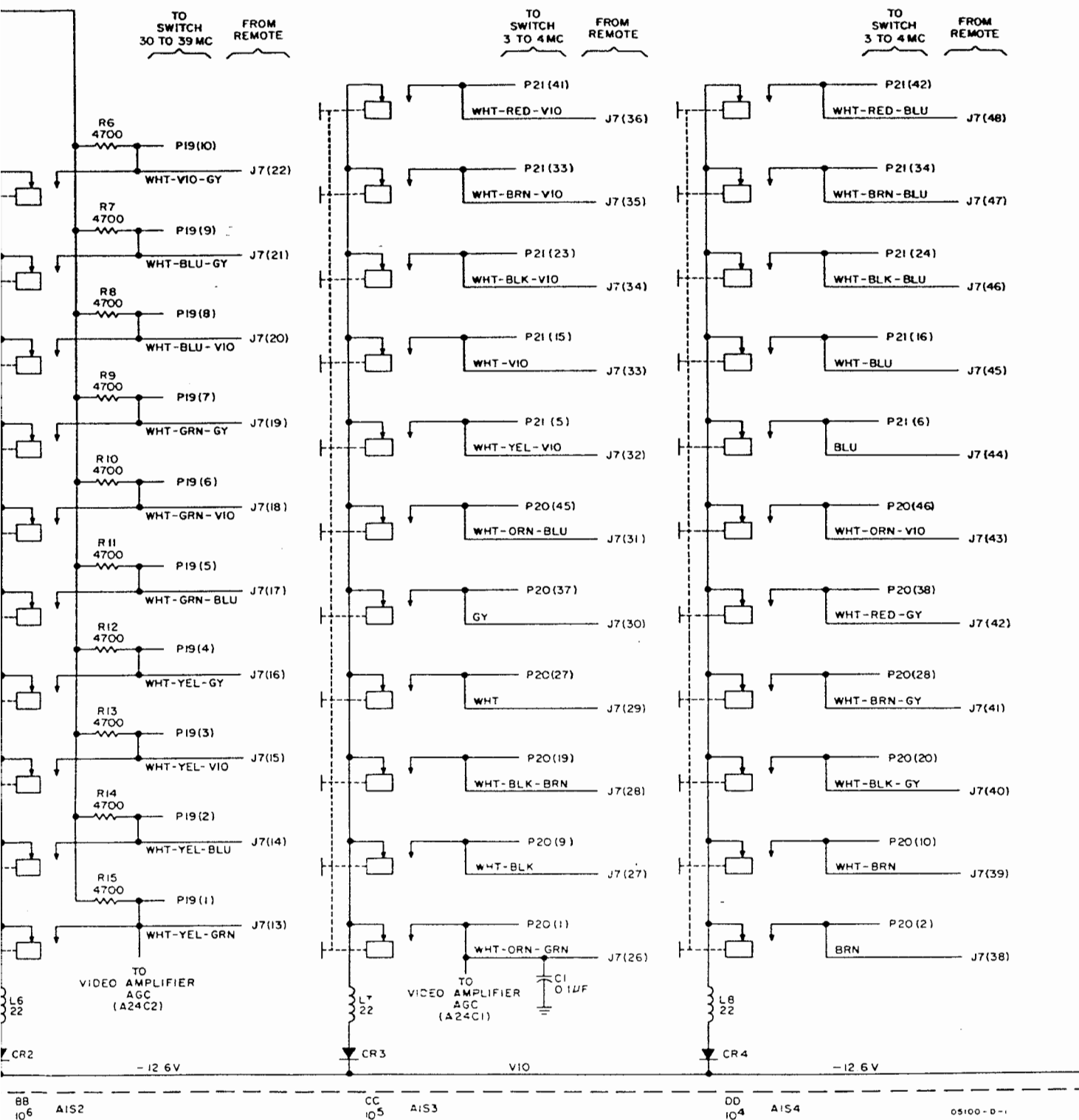
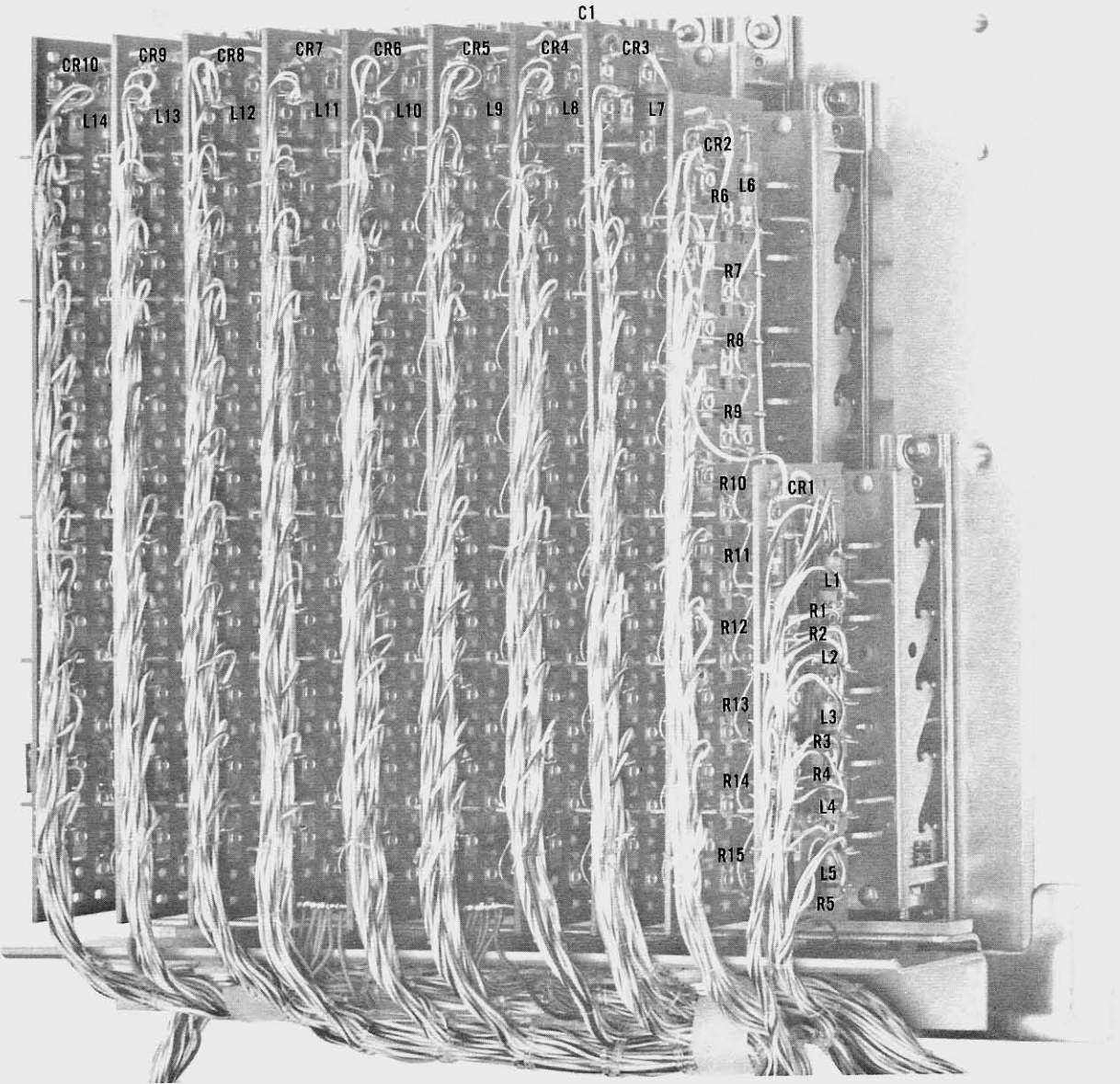
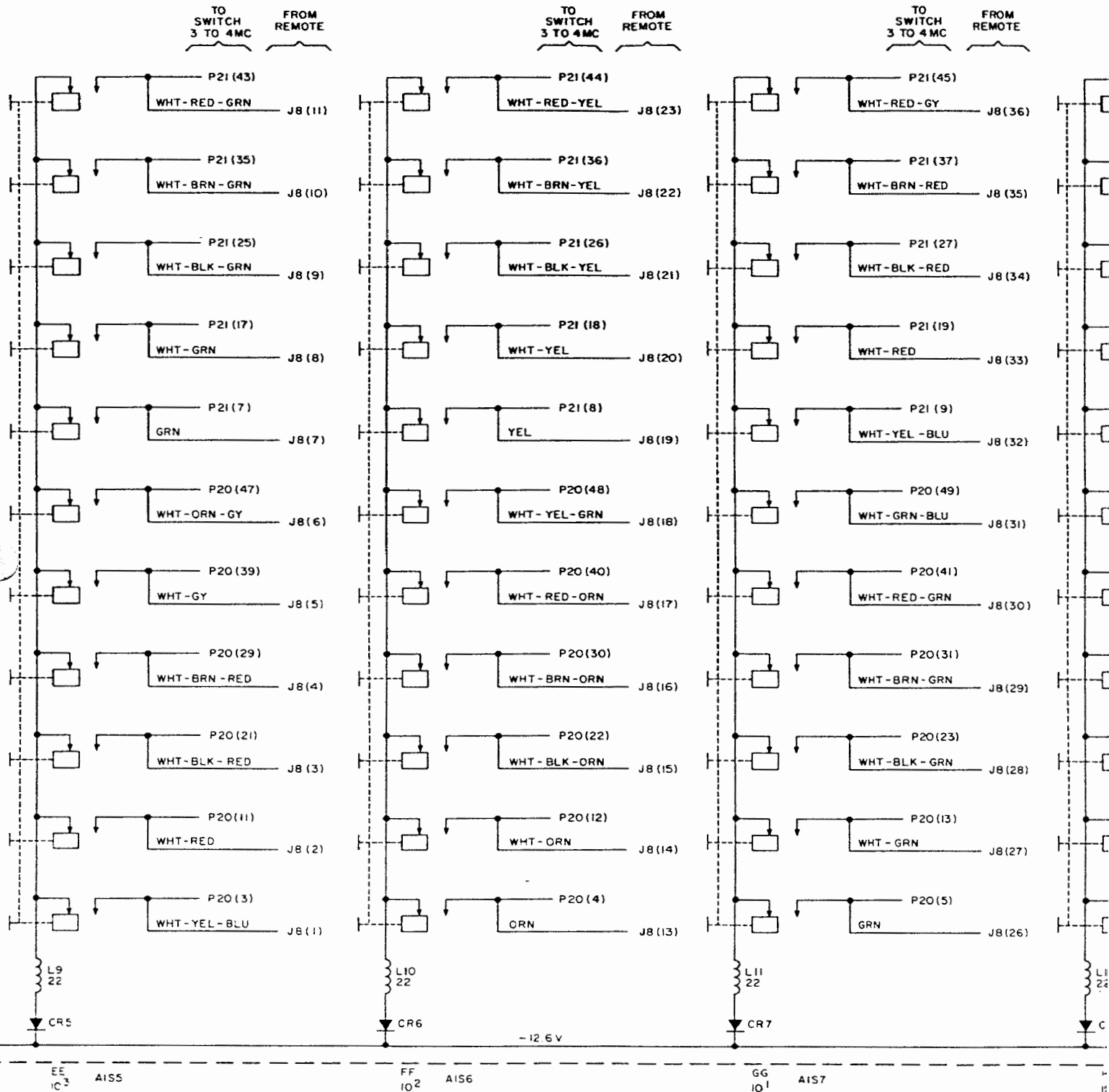


Figure 5-13. Pushbutton Switch A1 (Sheet 1 of 2)



A1

PART OF A1 PUSHBUTTON SWITCH ASSEMBLY (05100-6003) (SERIES 330)



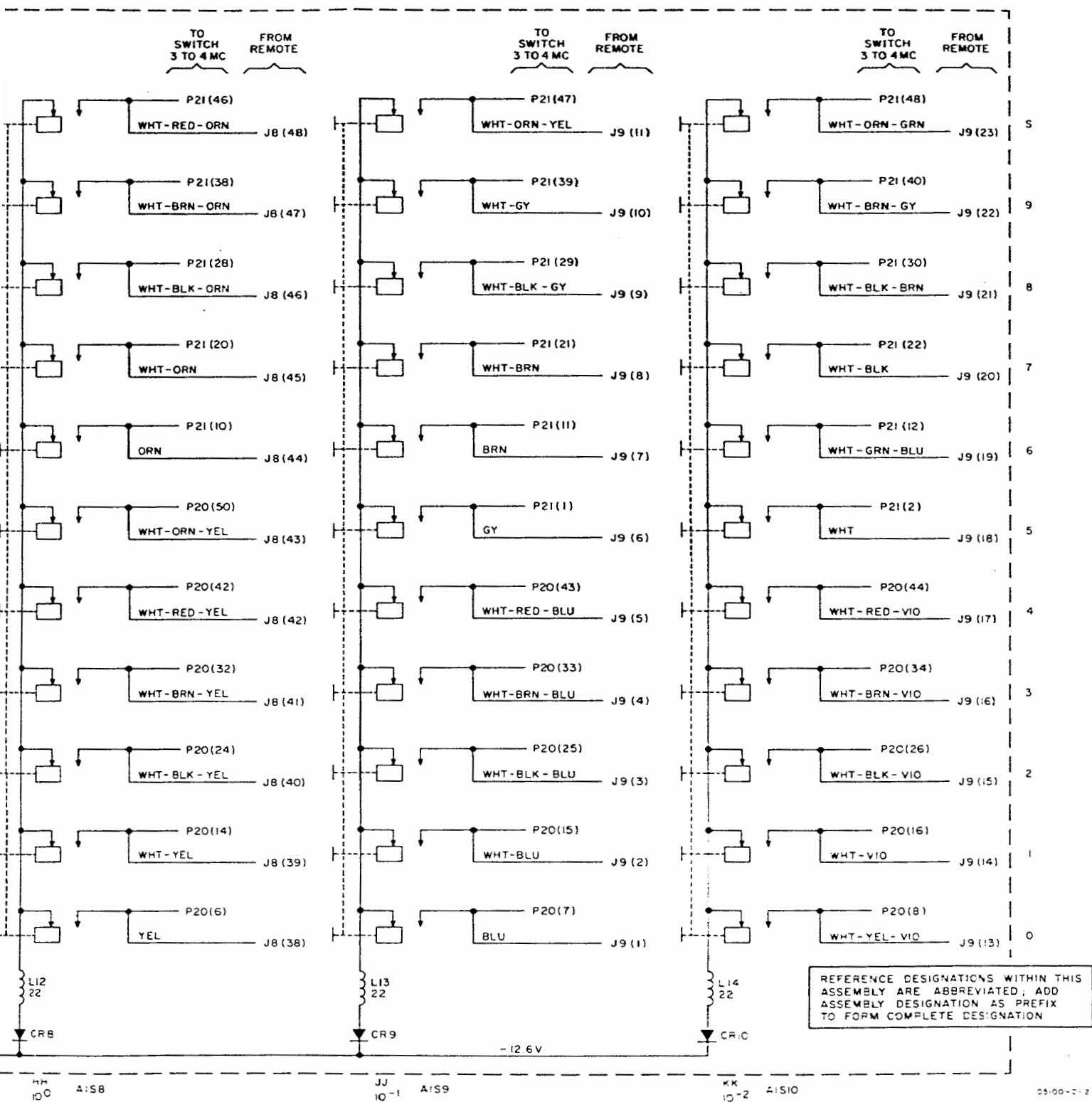
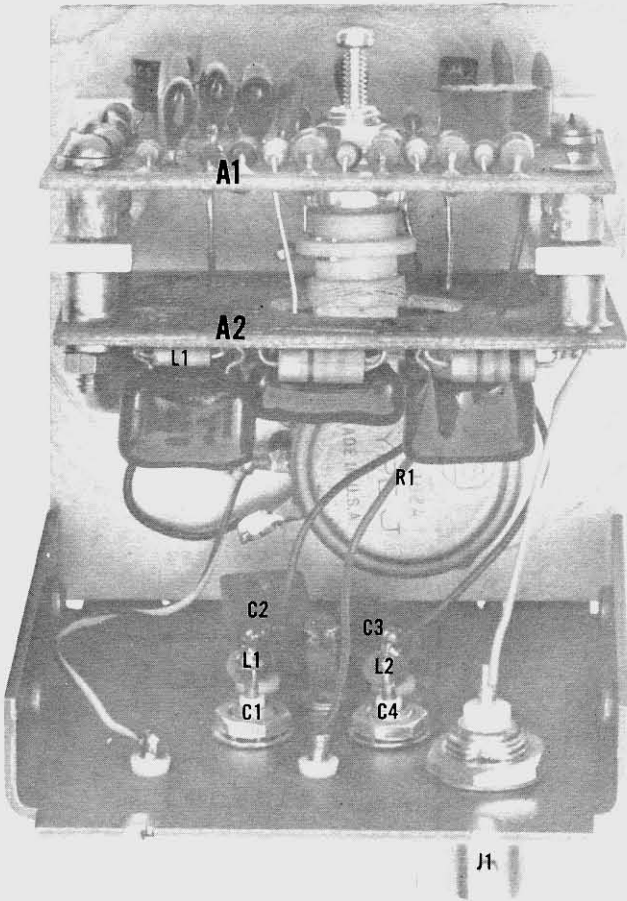
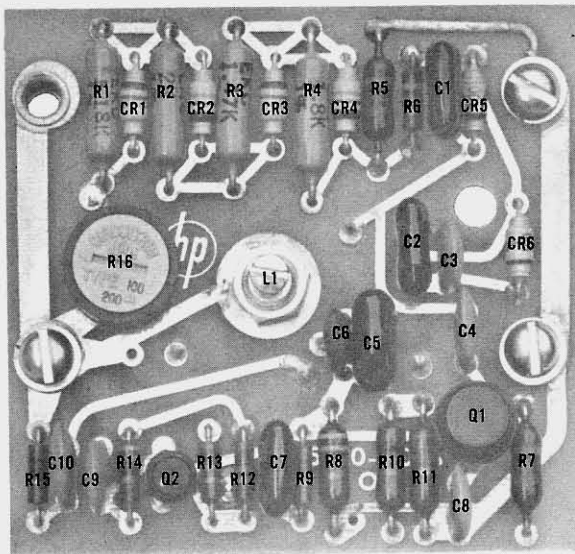


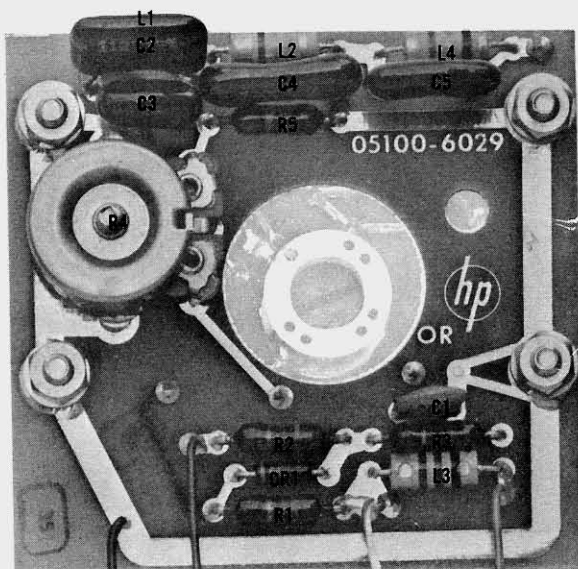
Figure 5-13. Pushbutton Switch A1 (Sheet 2)



A2



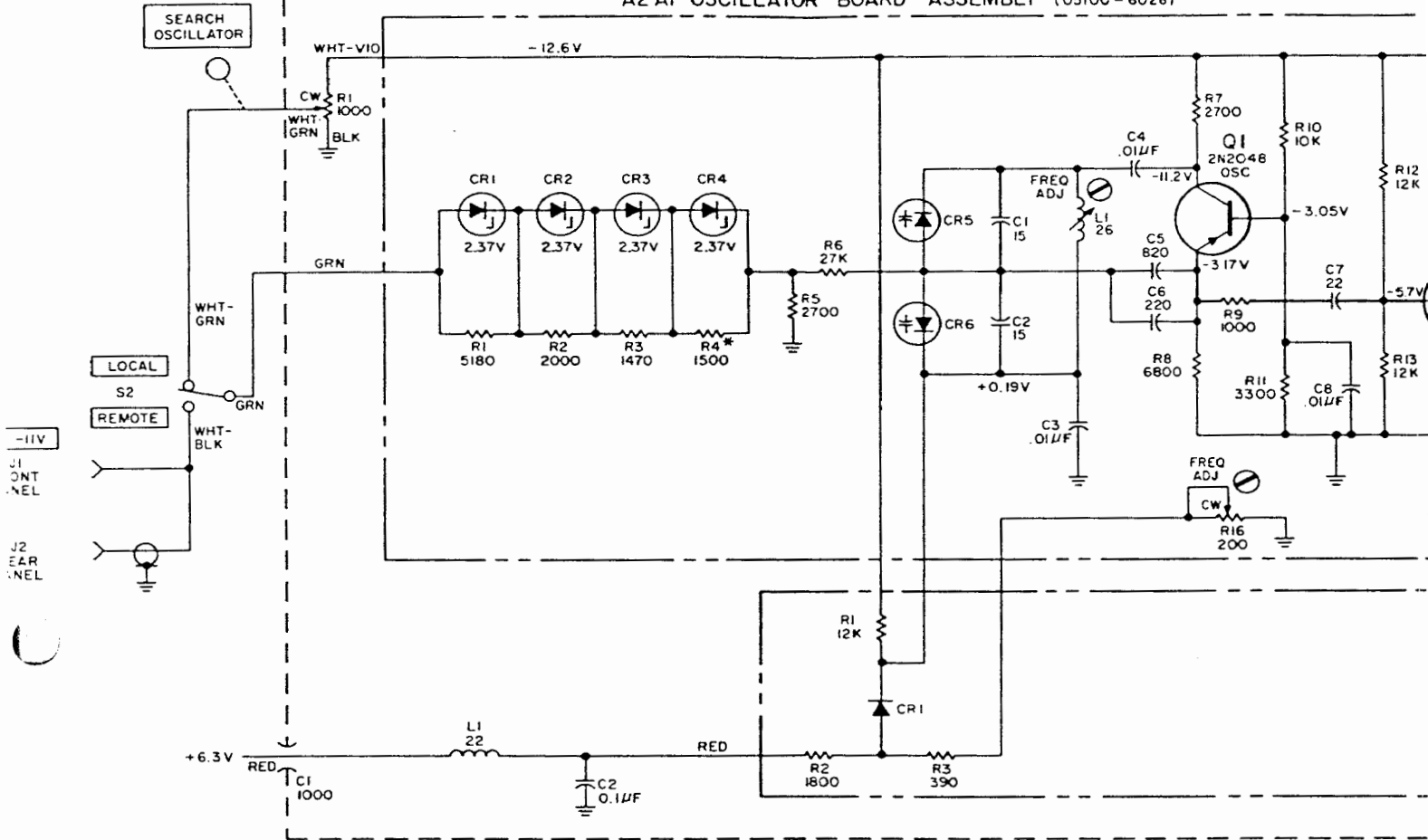
A2A1



A2A2

A2 SEARCH OSCILLATOR MODULE

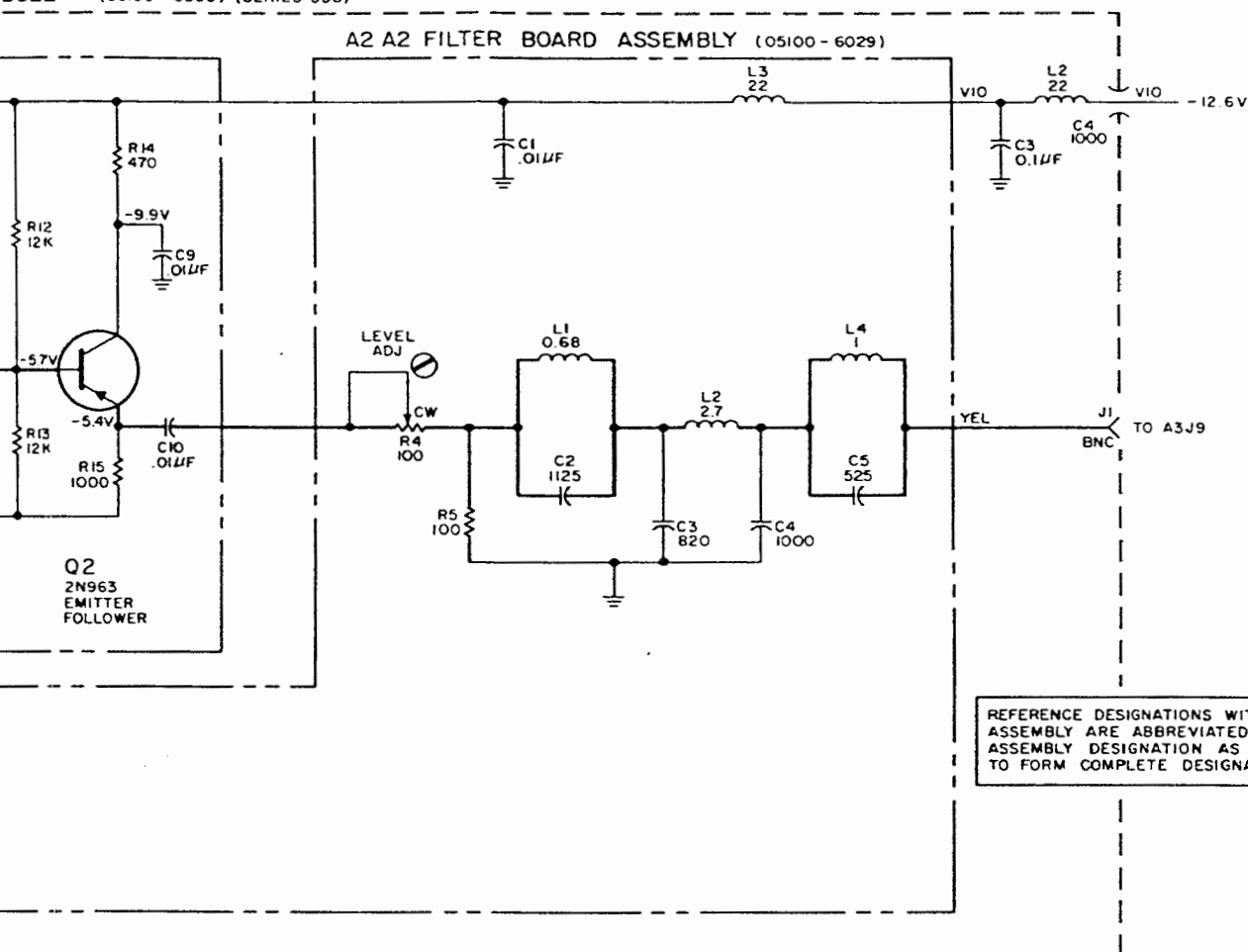
A2 A1 OSCILLATOR BOARD ASSEMBLY (05100-6028)



REFERENCE DESIGNATIONS

NO PREFIX	A2	A2A1	A2A2
J1-2	C1-4 J1 L1-2 R1	C1-10 CR1-6 L1 Q1-2 R1-16	C1-5 CR1 L1-4 R1-5
S2			

DULE (05100 - 6005) (SERIES 330)



REFERENCE DESIGNATIONS WITHIN THIS
ASSEMBLY ARE ABBREVIATED. ADD
ASSEMBLY DESIGNATION AS PREFIX
TO FORM COMPLETE DESIGNATION

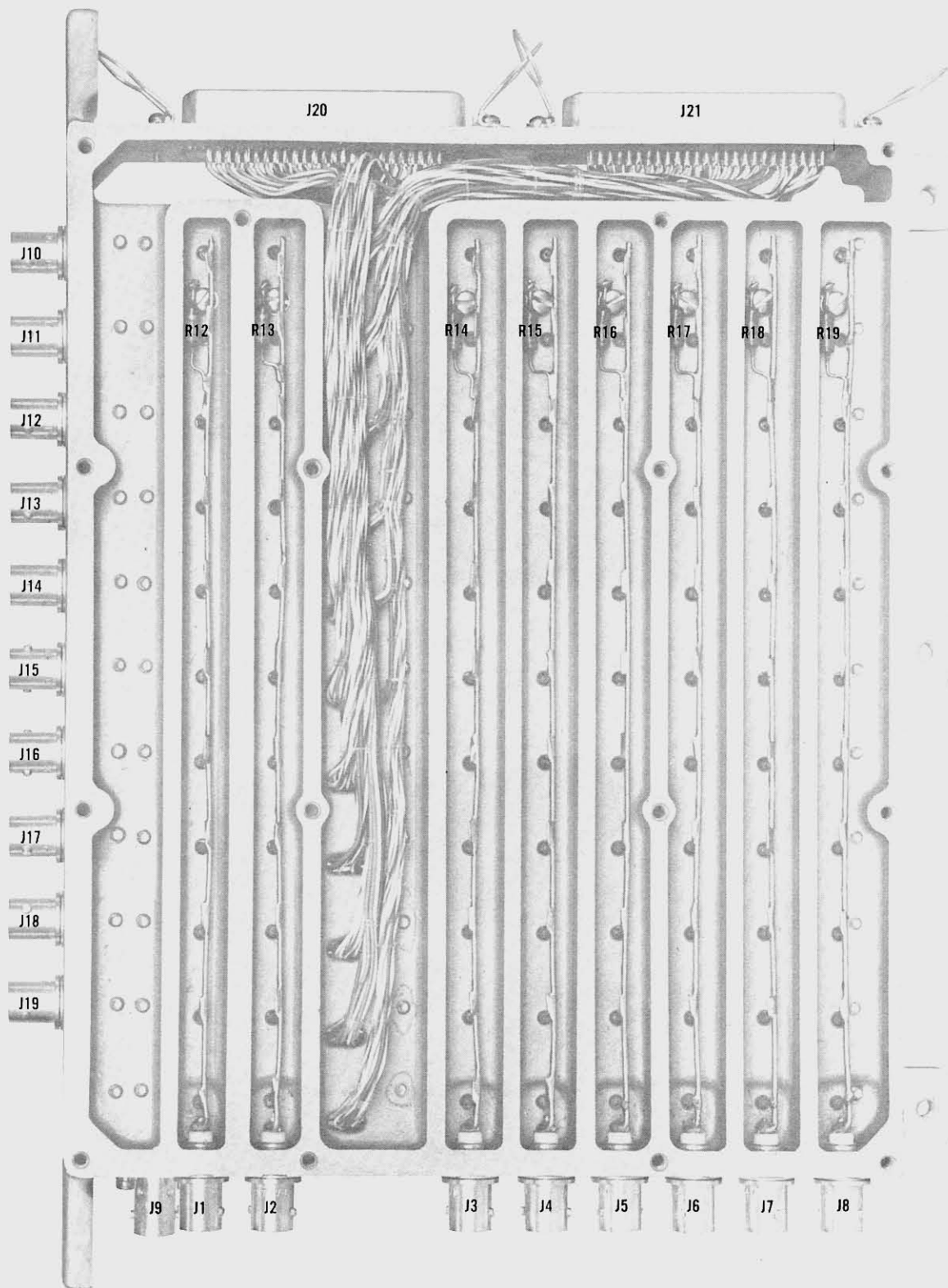
NOTES

1. UNLESS OTHERWISE INDICATED:
RESISTANCE IN OHMS;
CAPACITANCE IN PICO FARADS
INDUCTANCE IN MICROHENRIES
2. ASTERISK (*) INDICATES FACTORY
SELECTED COMPONENT, TYPICAL
VALUE GIVEN

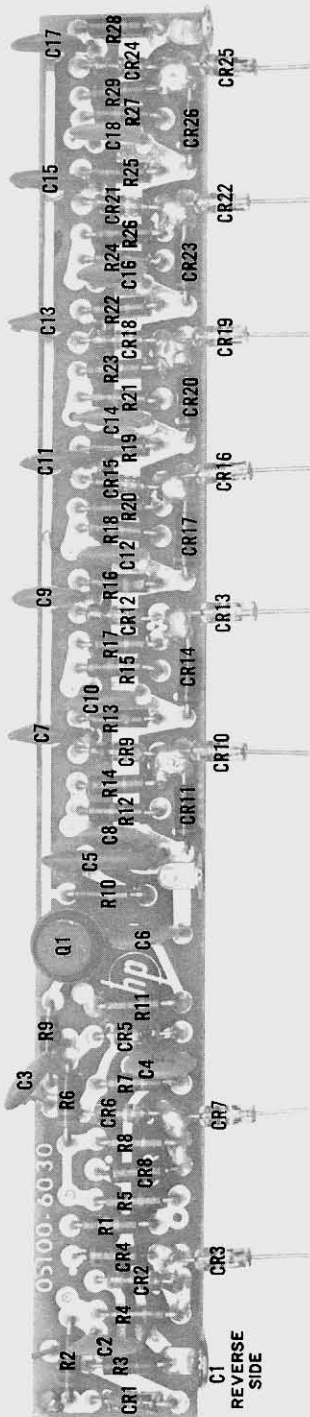
EWLETT - PACKARD COMPANY

05100 - D - 3

Figure 5-14. Search Oscillator



A3



A3A1-A11

REFERENCE DESIGNATIONS

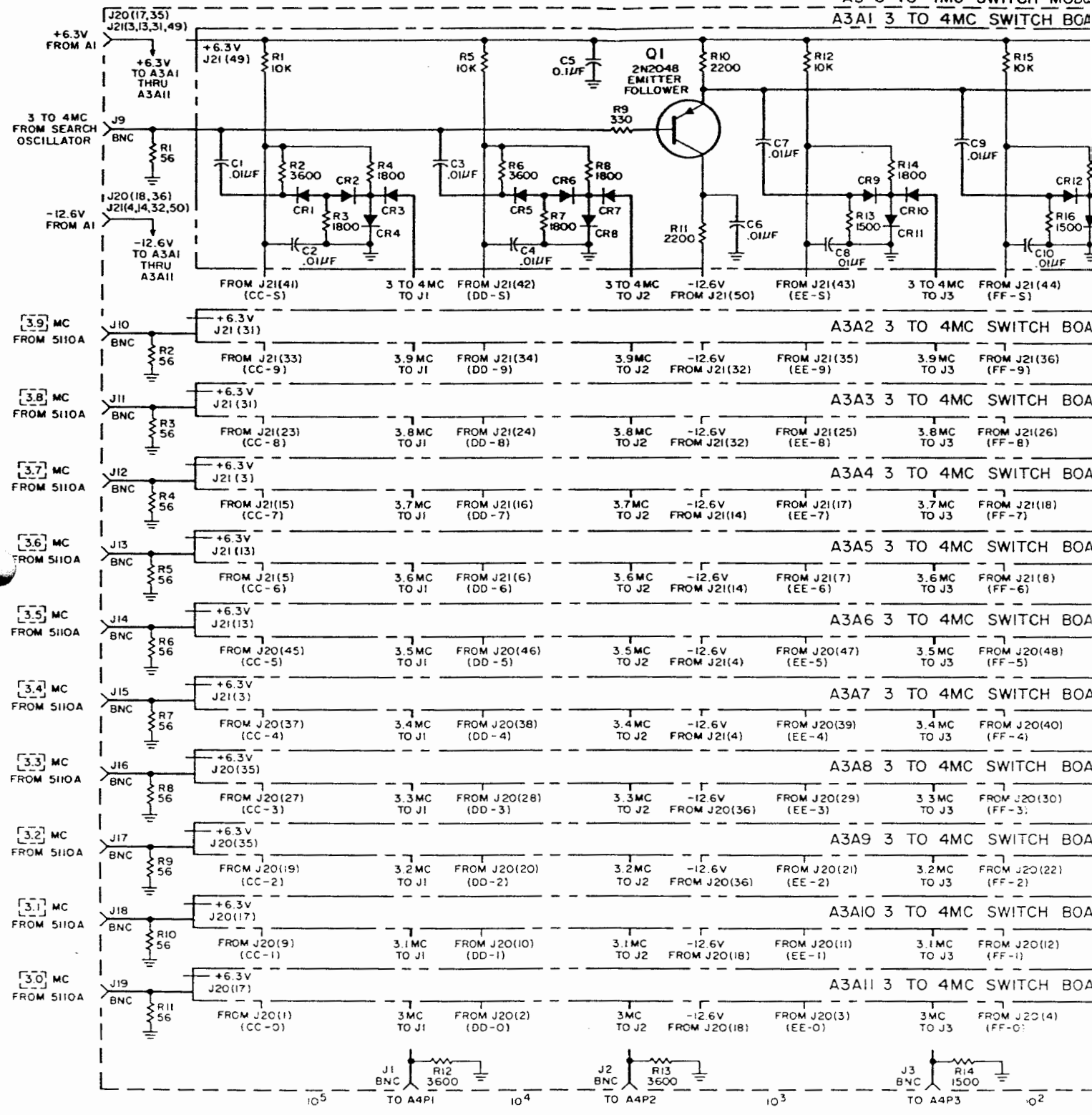
A3	A3A1-A3A11
J1 - 21	C1 - 18 CR1 - 26
R1 - 19	Q1 R1 - 29

NOTES

1. REFERENCE DESIGNATIONS WITHIN THIS ASSEMBLY ARE ABBREVIATED. ADD ASSEMBLY DESIGNATION AS PREFIX TO FORM COMPLETE DESIGNATION
2. UNLESS OTHERWISE INDICATED:
RESISTANCE IN OHMS;
CAPACITANCE IN PICOFARADS

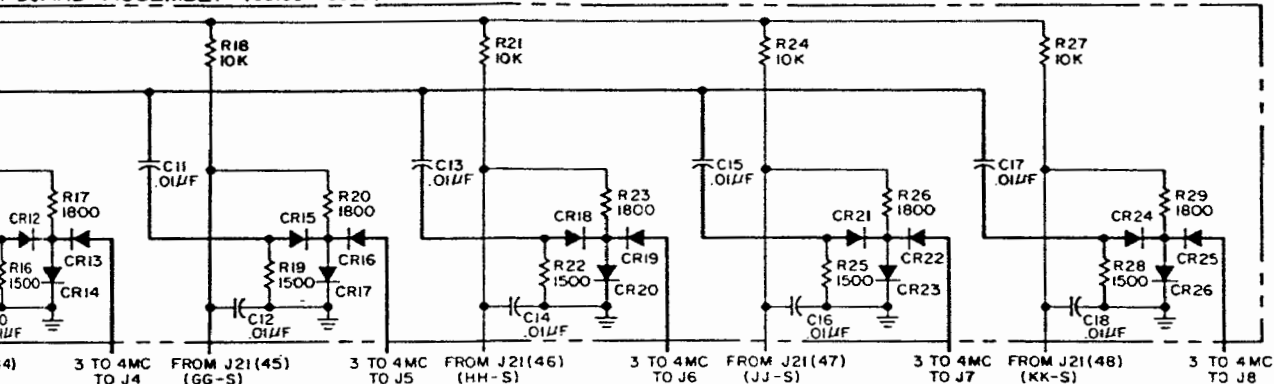
05100-D-4

A3 3 TO 4MC SWITCH MODL
A3A1 3 TO 4MC SWITCH BOA



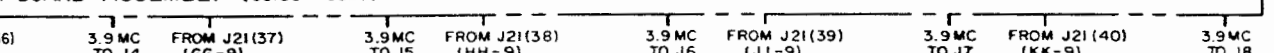
MODULE (05100 - 6006) (SERIES 330) (NOTE 1)

BOARD ASSEMBLY (05100 - 6030)



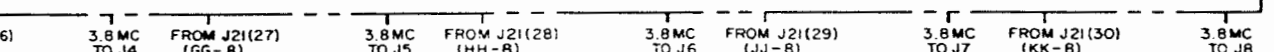
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BOARD ASSEMBLY (05100 - 6030)



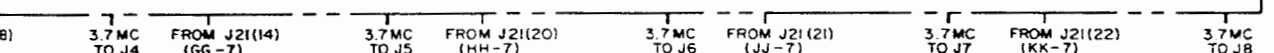
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BOARD ASSEMBLY (05100 - 6030)



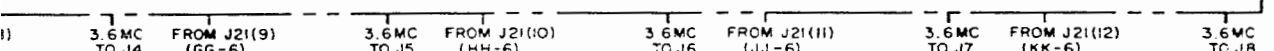
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BOARD ASSEMBLY (05100 - 6030)



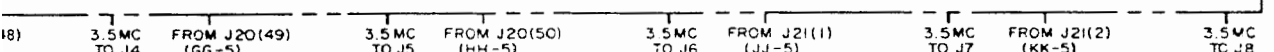
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BOARD ASSEMBLY (05100 - 6030)



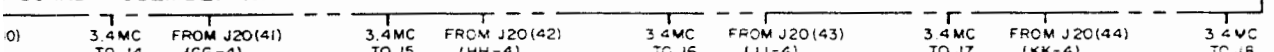
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BOARD ASSEMBLY (05100 - 6030)



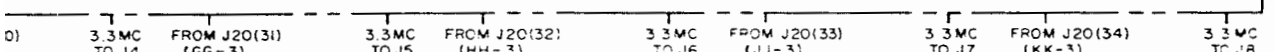
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BOARD ASSEMBLY (05100 - 6030)



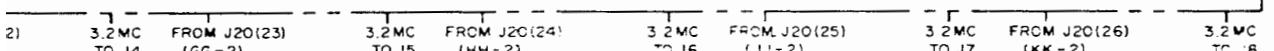
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BOARD ASSEMBLY (05100 - 6030)



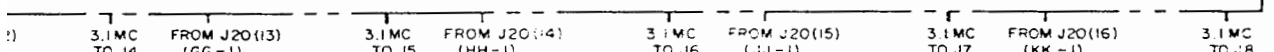
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3

BOARD ASSEMBLY (05100 - 6030)



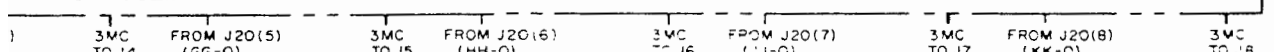
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2

BOARD ASSEMBLY (05100 - 6030)

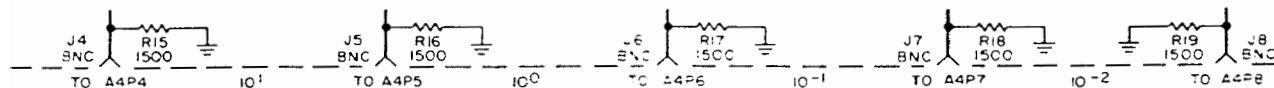


ROW
1

BOARD ASSEMBLY (05100 - 6030)



ROW
0



05100-6030

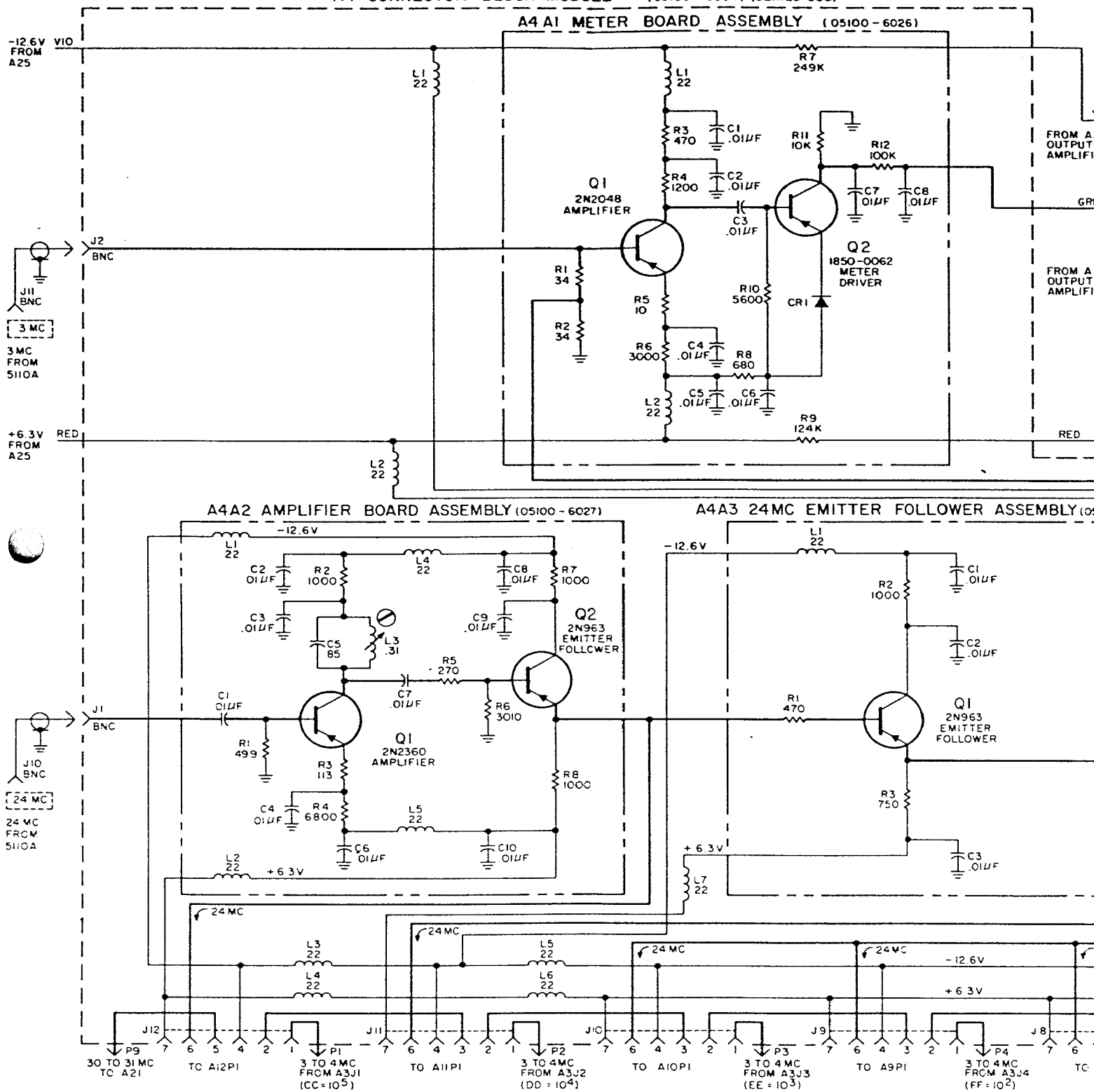
-PACKARD COMPANY

Figure 5-15. 3 to 4 Mc Switch

A4A2, A3, A4

(05100 - 6004) (SERIES 330)

(05100 - 6026)



NOTES

1. UNLESS OTHERWISE INDICATED:
RESISTANCE IN OHMS;
CAPACITANCE IN PICO FARADS
INDUCTANCE IN MICROHENRIES

REFERENCE DESIGNATIONS

NO PREFIX	A4	A4A1	A4A2	A4A3/ A4A4
JKO,II	J1,2,5-12	C1 - 8 CR1	C1 - 10	C1 - 3
MI	LI - 8	LI - 2	LI - 5	LI
	PI - 9	Q1 - 2 RI - 12	Q1 - 2 RI - 8	Q1 RI - 3
S3				

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REFERENCE DESIGNATIONS WITHIN THIS
ASSEMBLY ARE ABBREVIATED. ADD
ASSEMBLY DESIGNATION AS PREFIX TO
FORM COMPLETE DESIGNATION

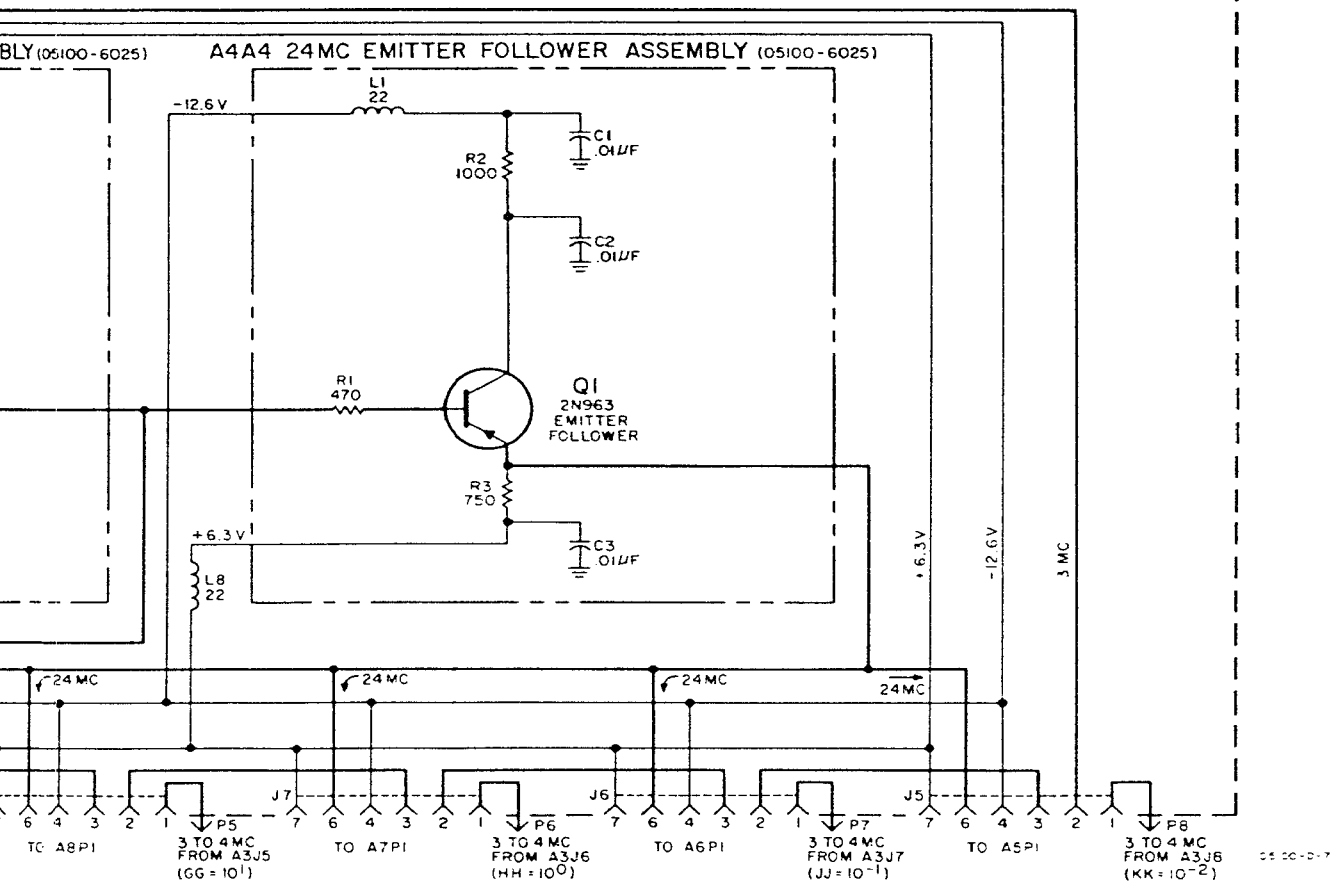
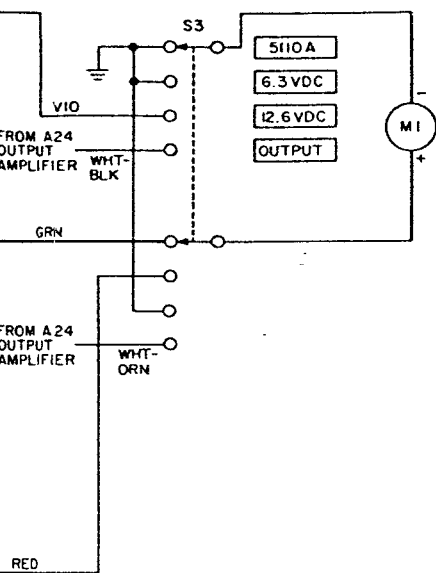
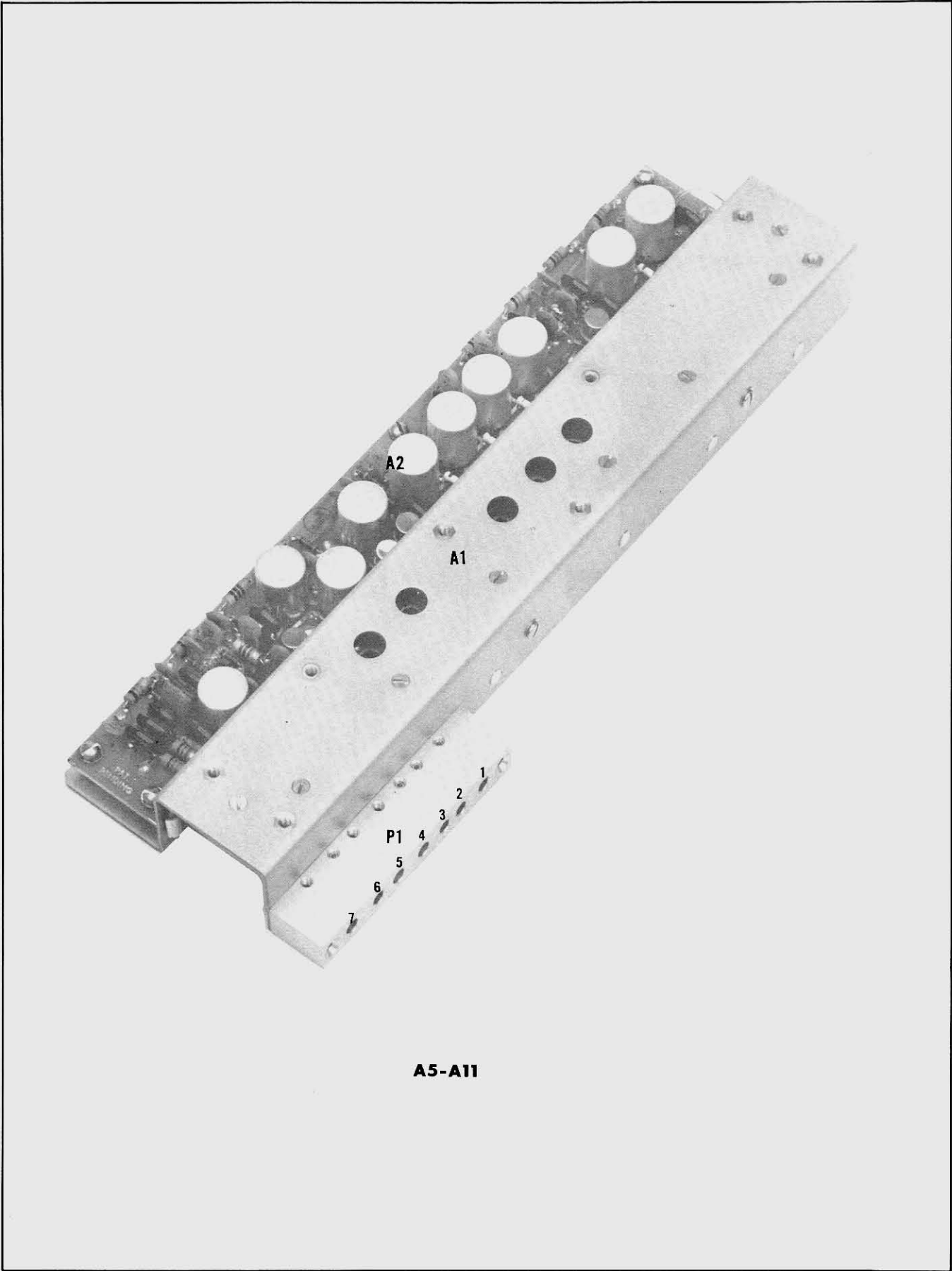
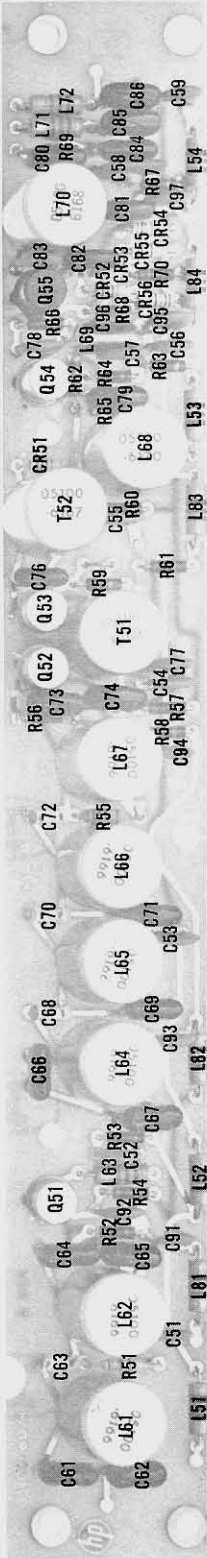
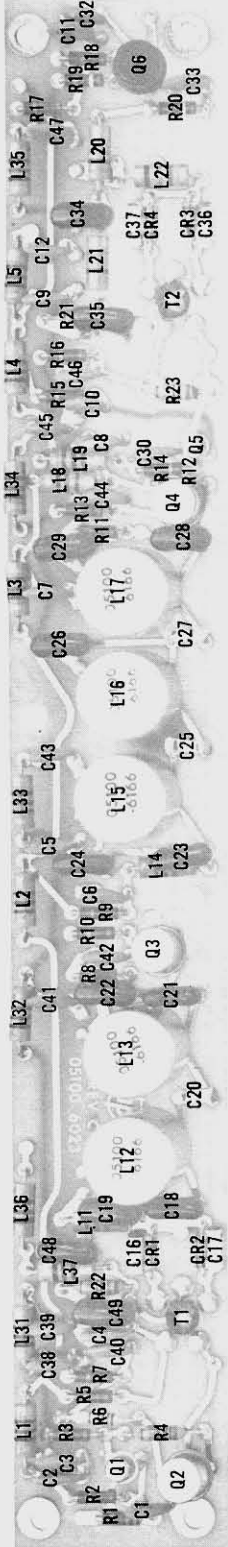


Figure 5-16. Connector Block A.





A5-A11A2



A5-A12A1

NOTES

- 1. UNLESS OTHERWISE INDICATED:
RESISTANCE IN OHMS;
CAPACITANCE IN PICO FARADS
INDUCTANCE IN MICROHENRIES
- 2. ASTERISK (*) INDICATES FACTORY
SELECTED COMPONENT, TYPICAL
VALUE GIVEN.

REFERENCE DESIGNATIONS

A5-A11	A5-A11A1	A5-A11A2
PI	C1 - 12, 16- 30, 32- 49	C51 - 59, 61 - 74, 76- 86, 91- 97
	CR1 - 4	CR51-56
	L1 - 5	L51 - 54, 61 - 72, 81 - 84
	Q1 - 6	Q51 - 55
	R1 - 23	R51 - 70
	T1, 2	T51, 52

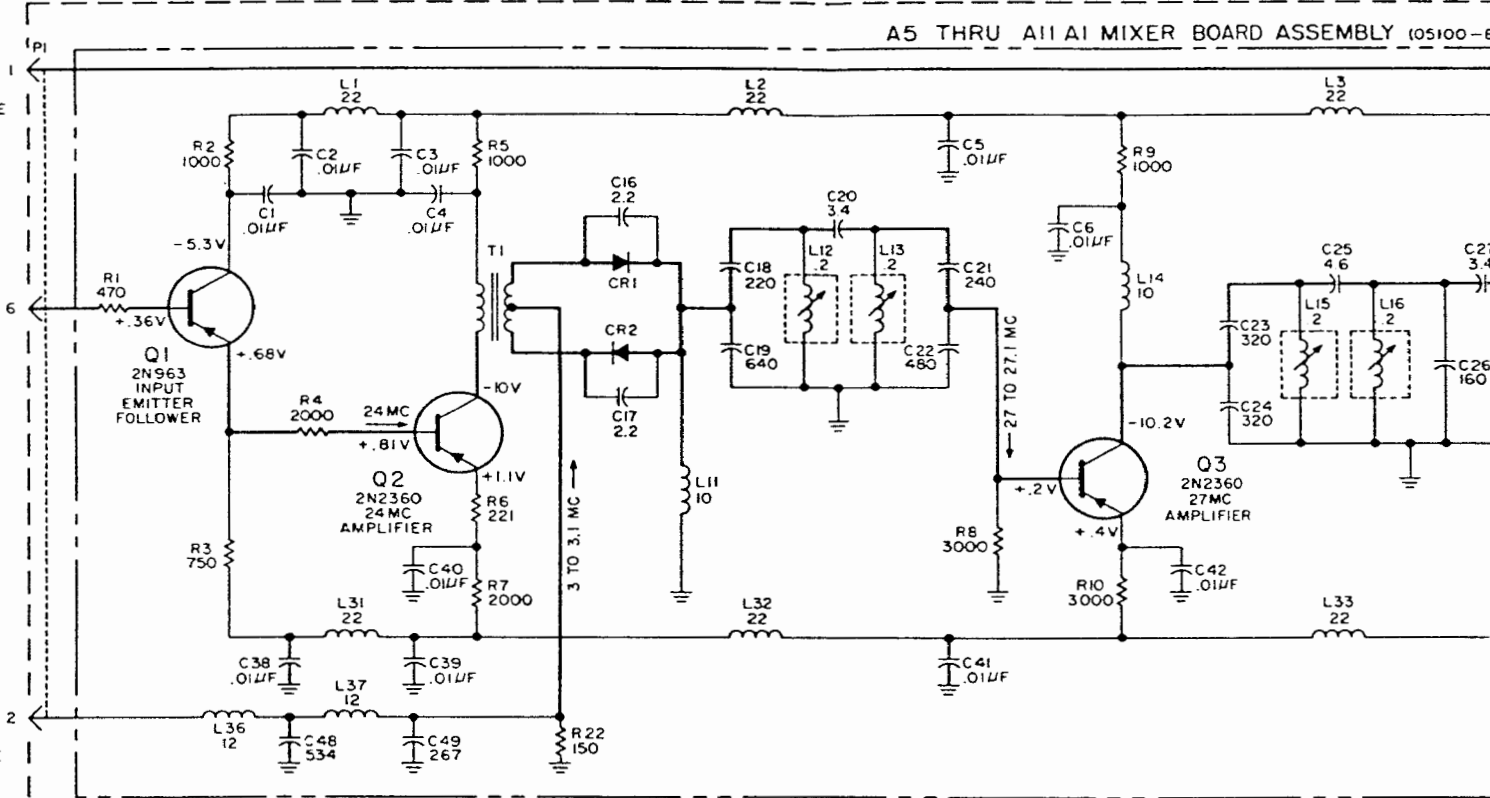
A5 THRU A11 MIXER/DIVIDER MODULE (05100-6)

A5 THRU A11 A1 MIXER BOARD ASSEMBLY (05100-6)

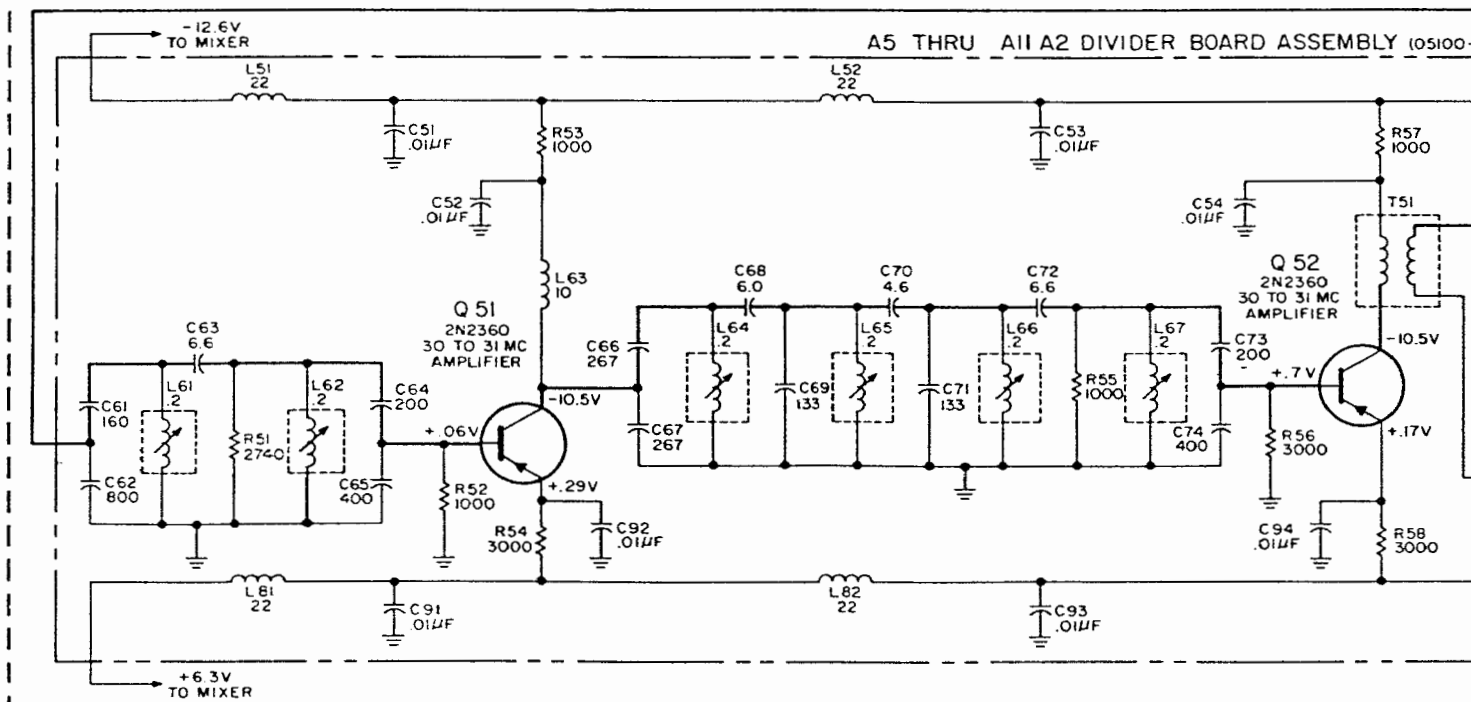
0.4 MC
M SWITCH
SEARCH
ILLATOR
U DECADE
VECTOR
K
S-II)

LIFIED
C FROM
A THRU
ICE
VECTOR
K
S-II)

FROM
A OR
TO 3.1 MC
V
K
S-II)

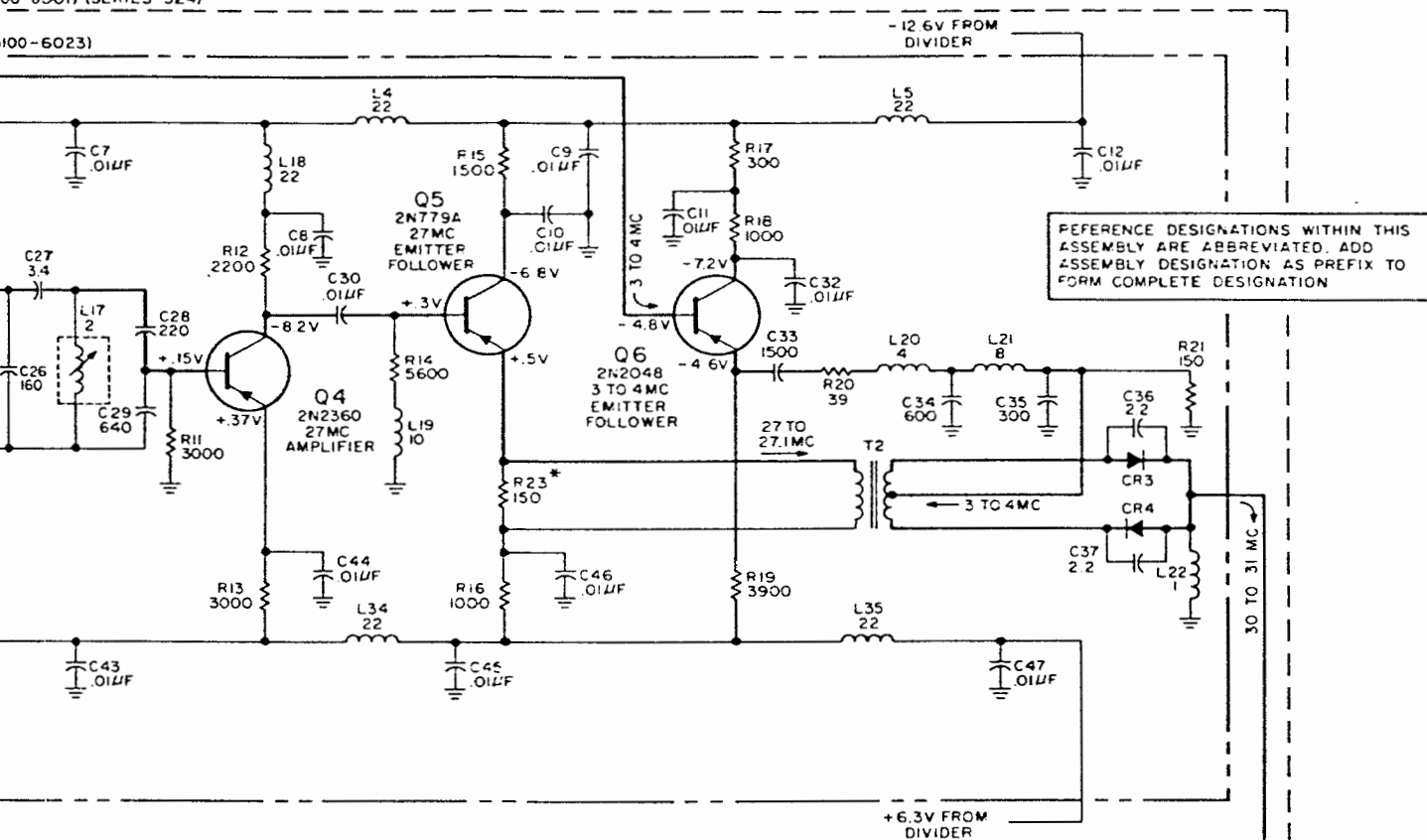


A5 THRU A11 A2 DIVIDER BOARD ASSEMBLY (05100-6)

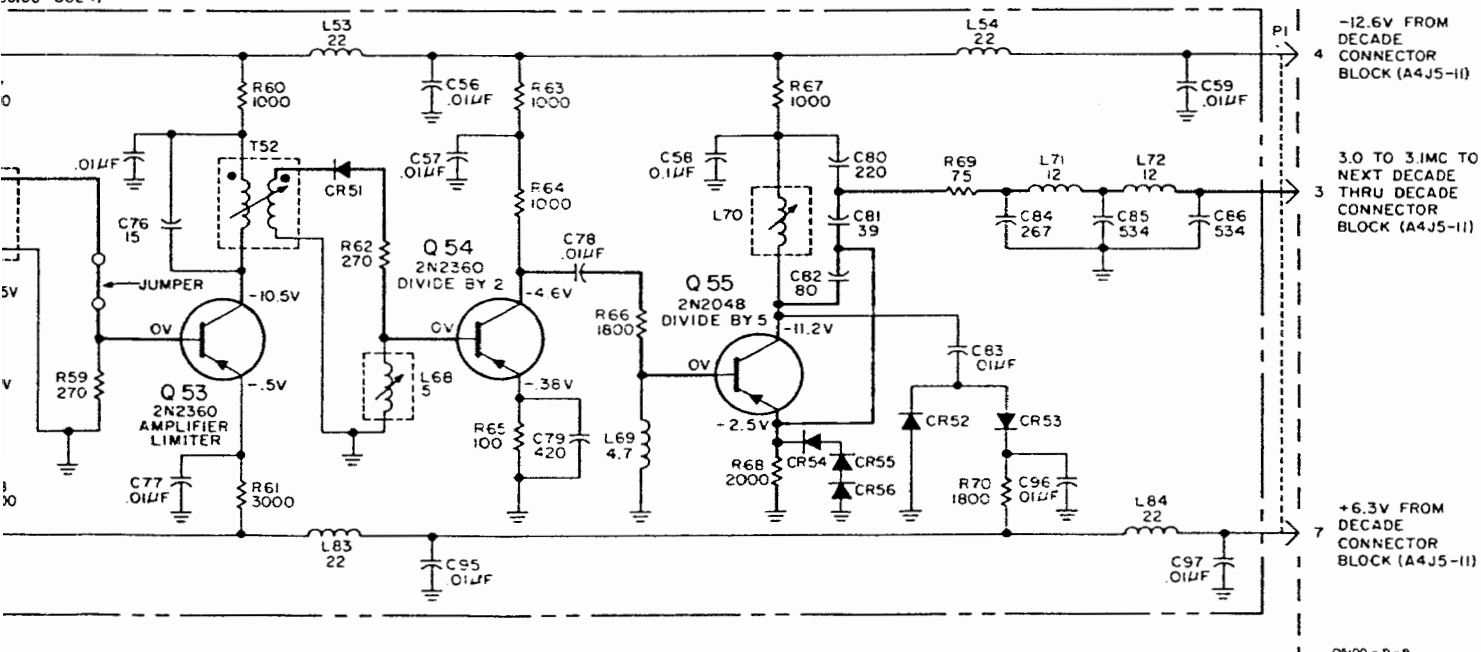


00-6001) (SERIES 524)

100-6023)



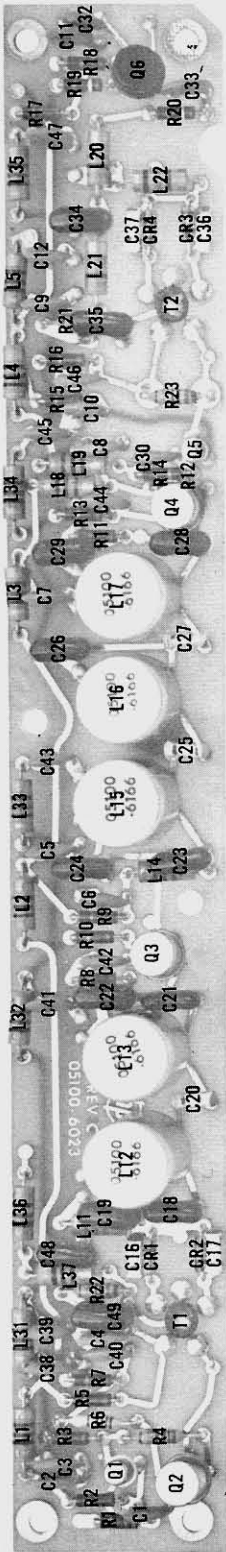
05100-6024)



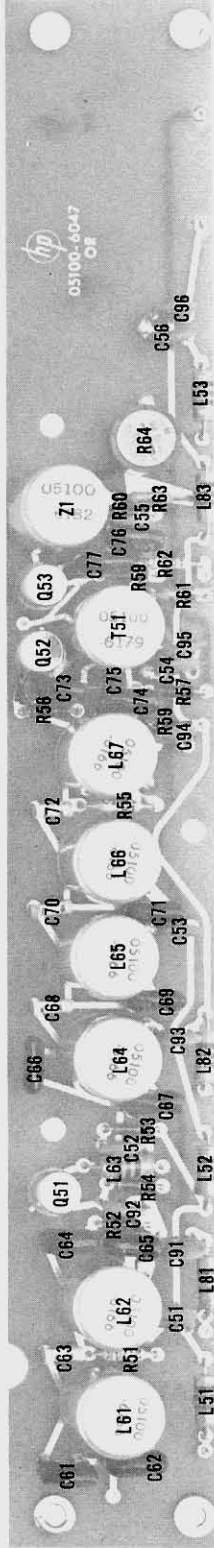
05100 - D - 9

-PACKARD COMPANY

Figure 5-17. Mixer/Divider A5 through



A5-A12A1



A12A2

NOTES

- 1. UNLESS OTHERWISE INDICATED:
RESISTANCE IN OHMS;
CAPACITANCE IN PICOFARADS
INDUCTANCE IN MICROHENRIES
- 2. ASTERISK (*) INDICATES FACTORY
SELECTED COMPONENT, TYPICAL
VALUE GIVEN.

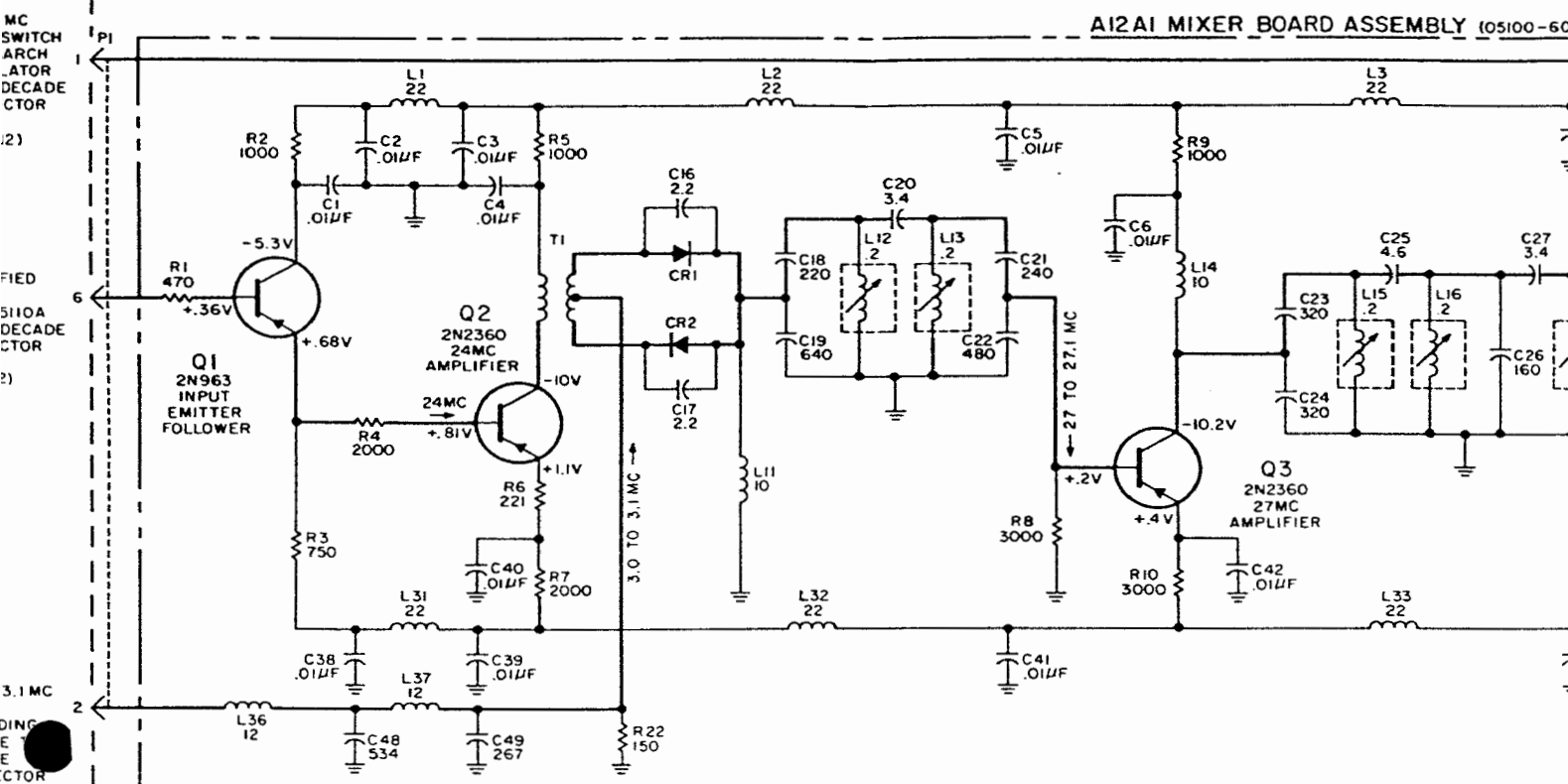
REFERENCE DESIGNATIONS

A12	A12A1	A12A2
P1	C1 - 12, 16 - 30, 32 - 49 C11 - 4 L1 - 5, 11 - 22, 31 - 37 Q1 - 6 R1 - 23 T1, 2	C51 - 56, 61 - 78, 91 - 96 L51 - 53, 61 - 68, 81 - 83 Q51 - 53 R51 - 64 T51 Z1

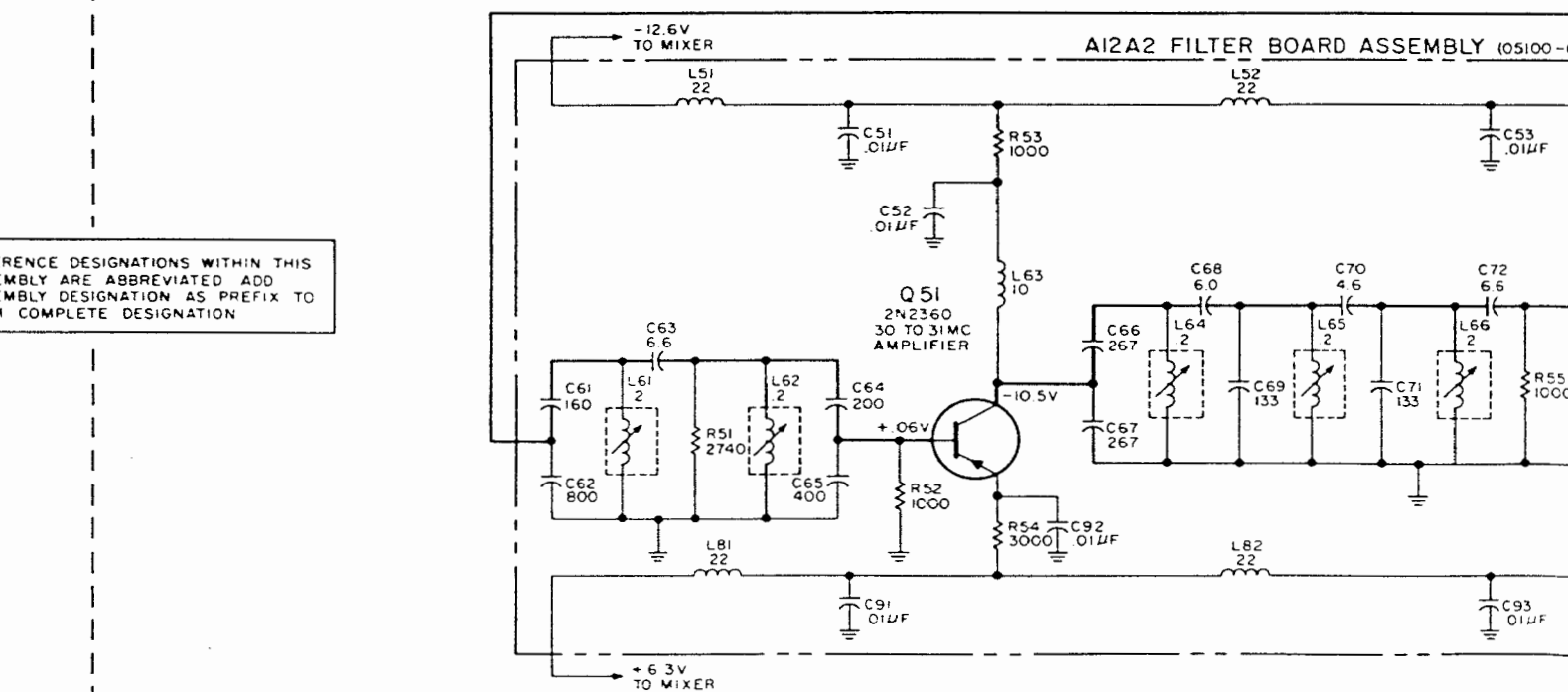
05100-D-10

A12 MIXER/FILTER MODULE (05100-6002)

A12A1 MIXER BOARD ASSEMBLY 105100-60



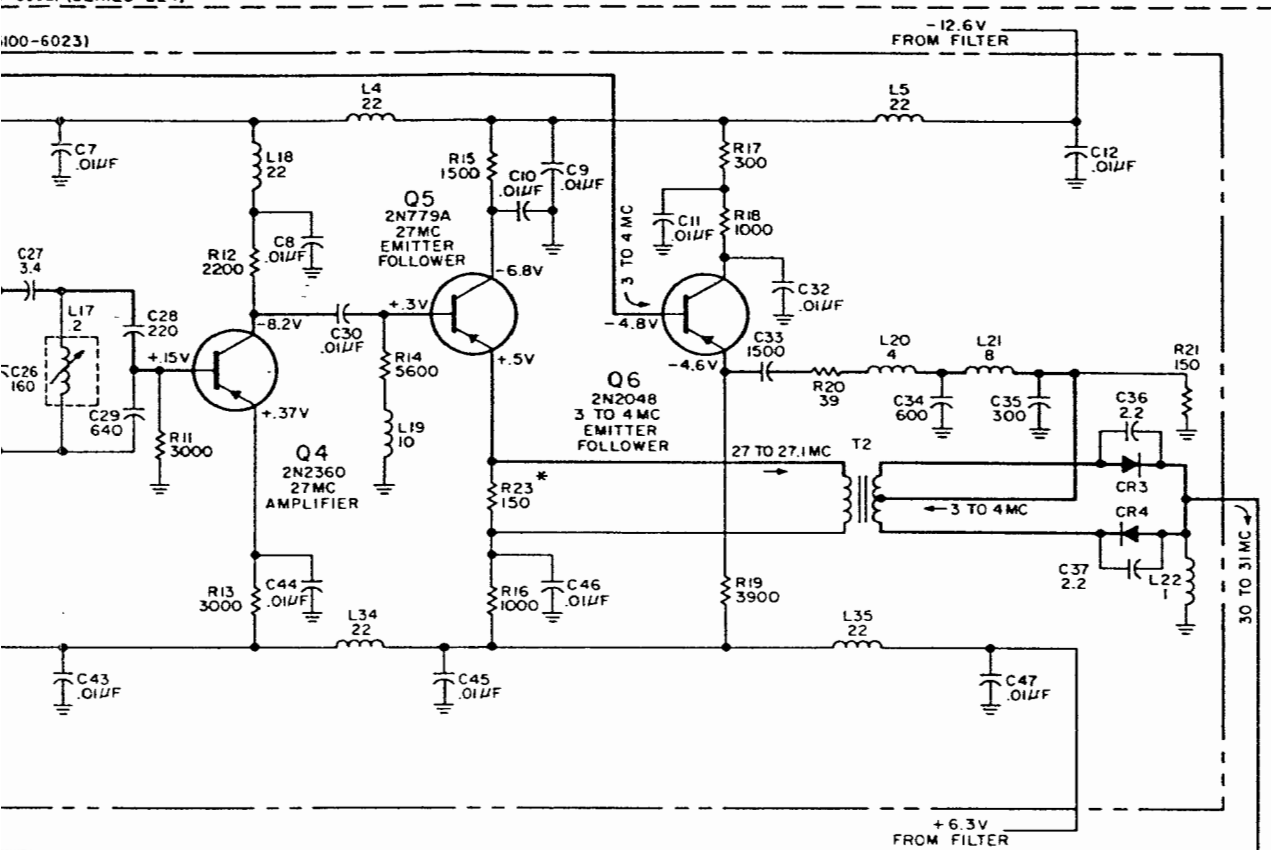
AI2A2 FILTER BOARD ASSEMBLY (05100-



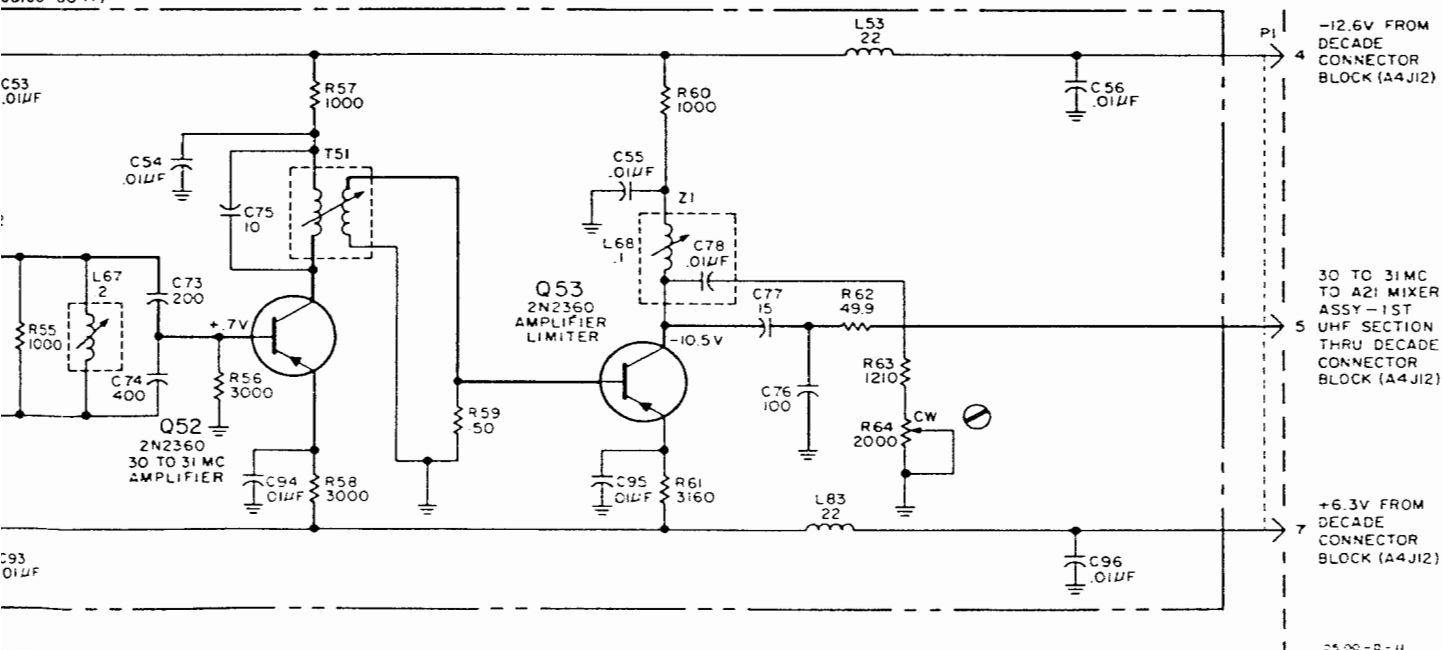
RENCE DESIGNATIONS WITHIN THIS
MBLY ARE ABBREVIATED ADD
MBLY DESIGNATION AS PREFIX TO
COMPLETE DESIGNATION

1-6002) (SERIES 524)

100-6023)

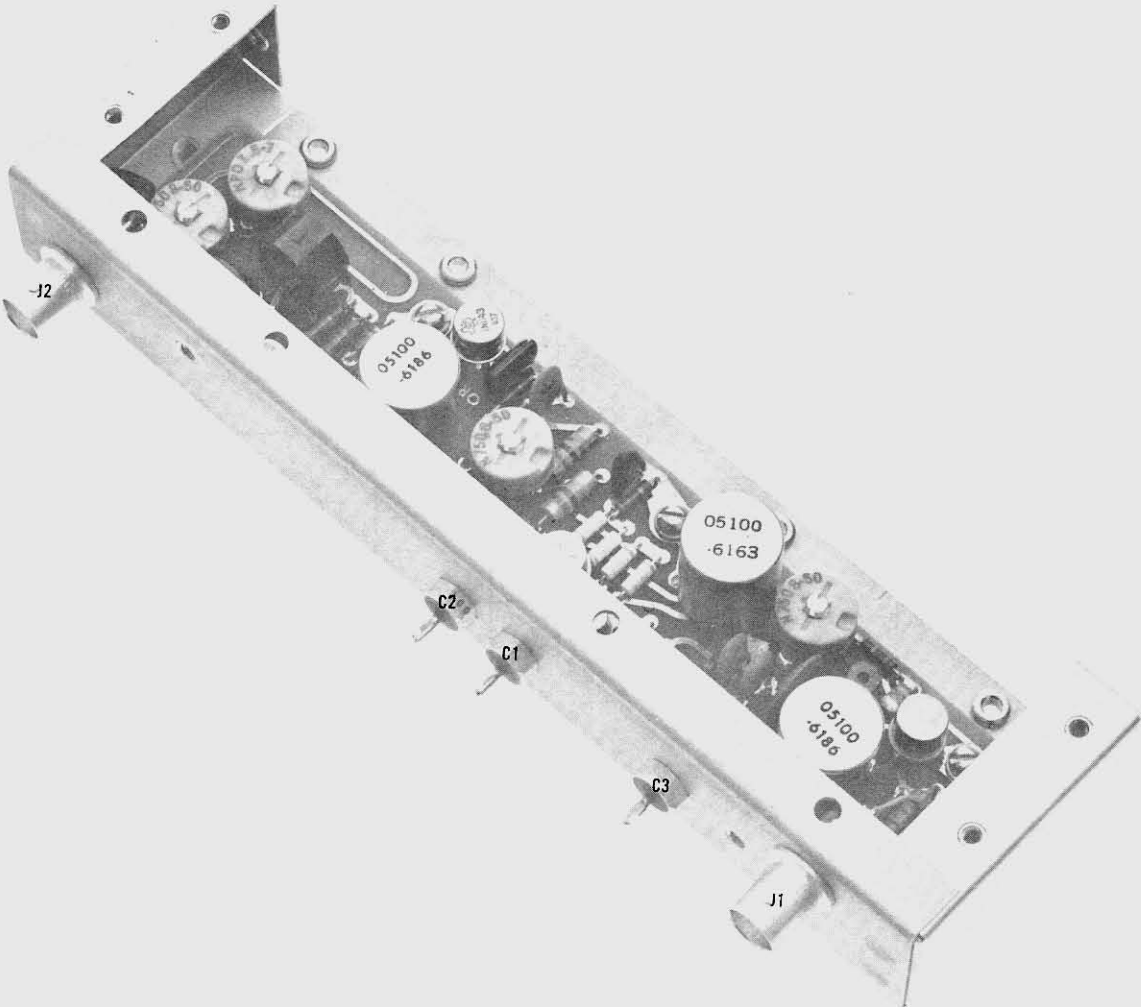


05100-6047)

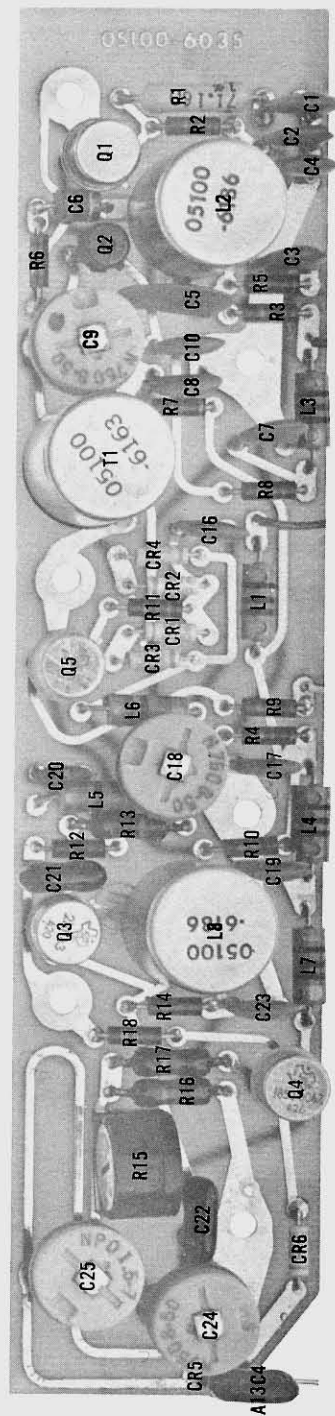


ACKARD COMPANY

Figure 5-18. Mixer/Filter A



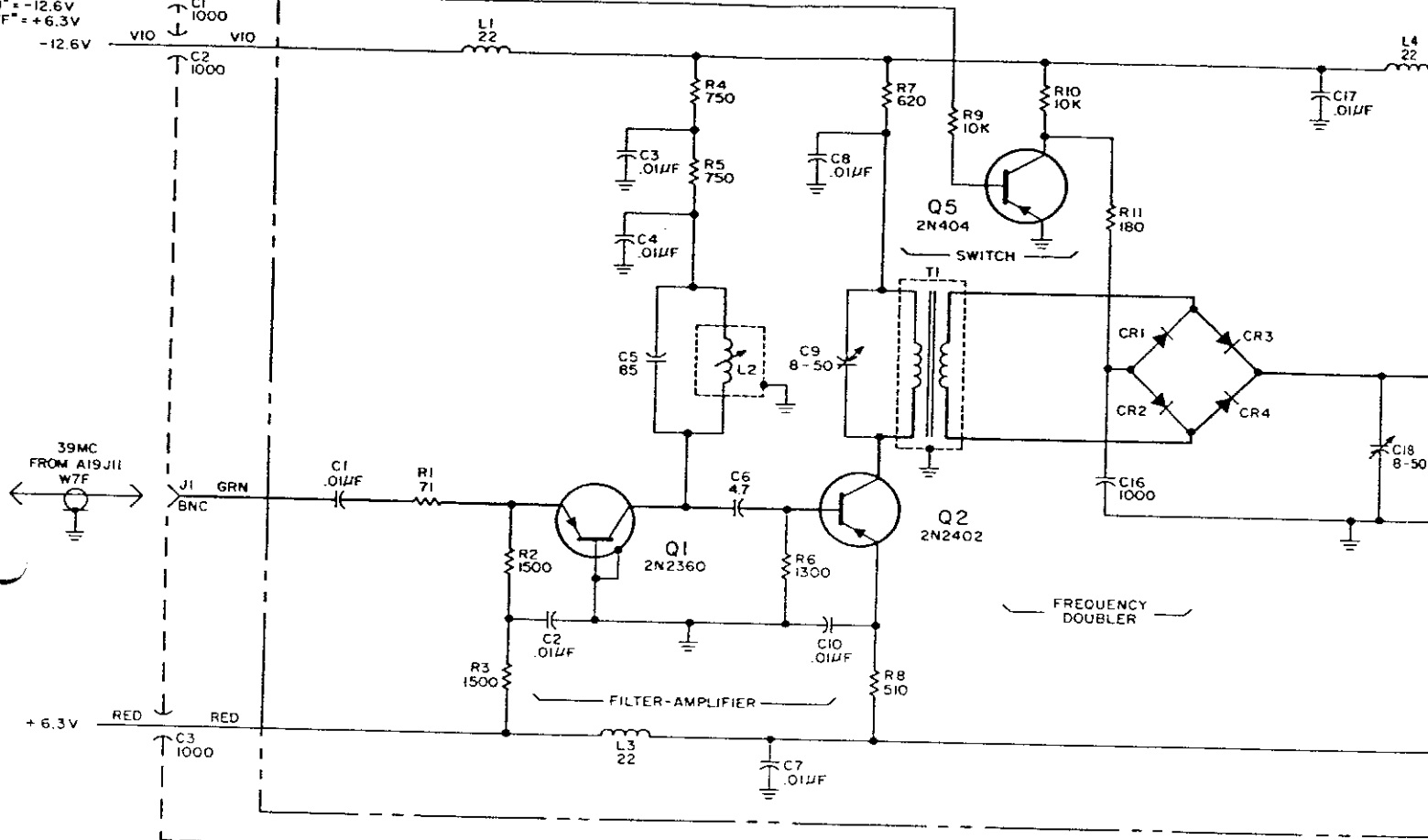
A13-A17



A13A1

CONTROL
VOLTAGE
FROM A1(AA-0)
"ON" = -12.6V
"OFF" = +6.3V

A13 39 TO 390MC MULTIPLIER MO A13A1 39 TO 390MC MULTIPLIER BOARD



NOTES

1. UNLESS OTHERWISE INDICATED
RESISTANCE IN OHMS;
CAPACITANCE IN PICOFARADS
INDUCTANCE IN MICROHENRIES

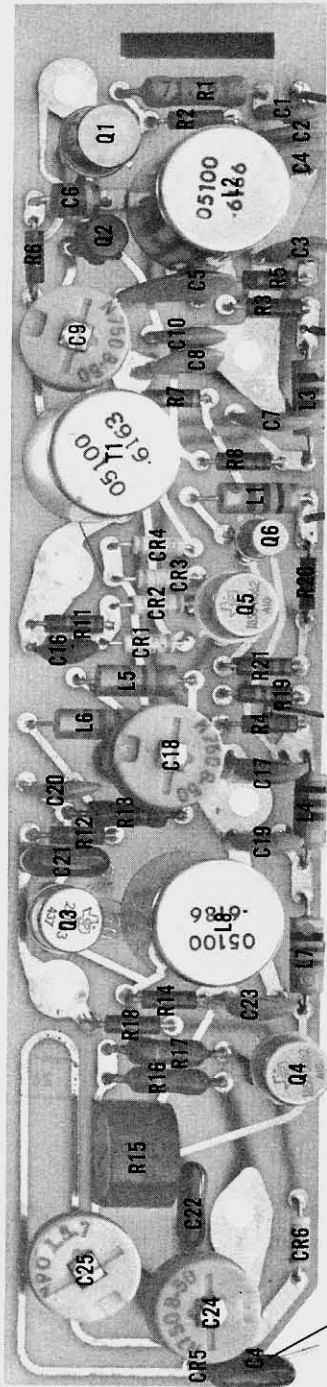
REFERENCE DESIGNATIONS

NO PREFIX	A13	A13A1
FL1	C1-4 J1,2	C1-4 J1,2 L1-4 Q1-2 R1-4 T1
W7F, W8F		



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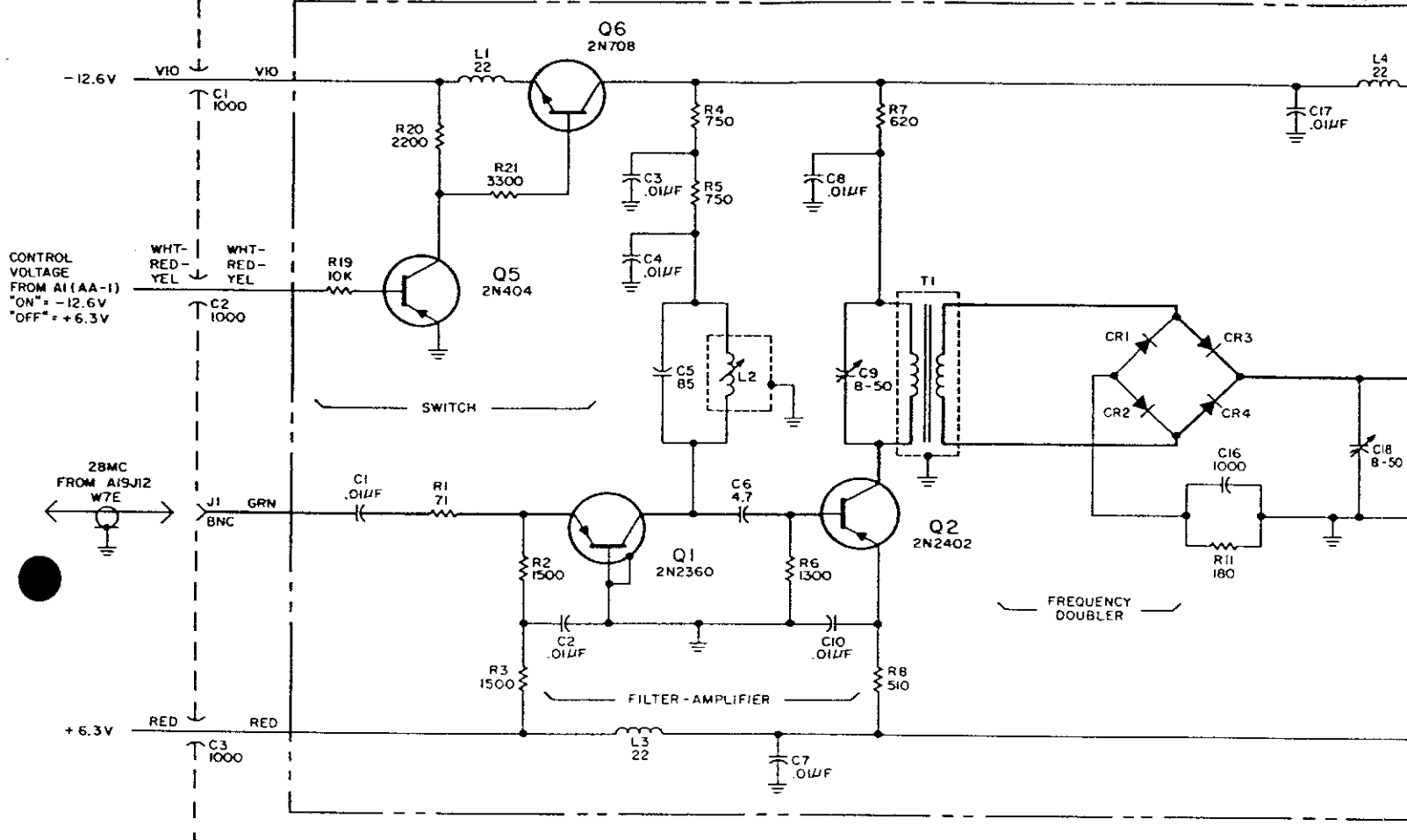
5-43/5-44



(Add module prefix
to component)

A14A1-A17A1

A14 38 TO 380MC MULTIPLIER MOD
A14 A1 38 TO 380MC MULTIPLIER BOARD

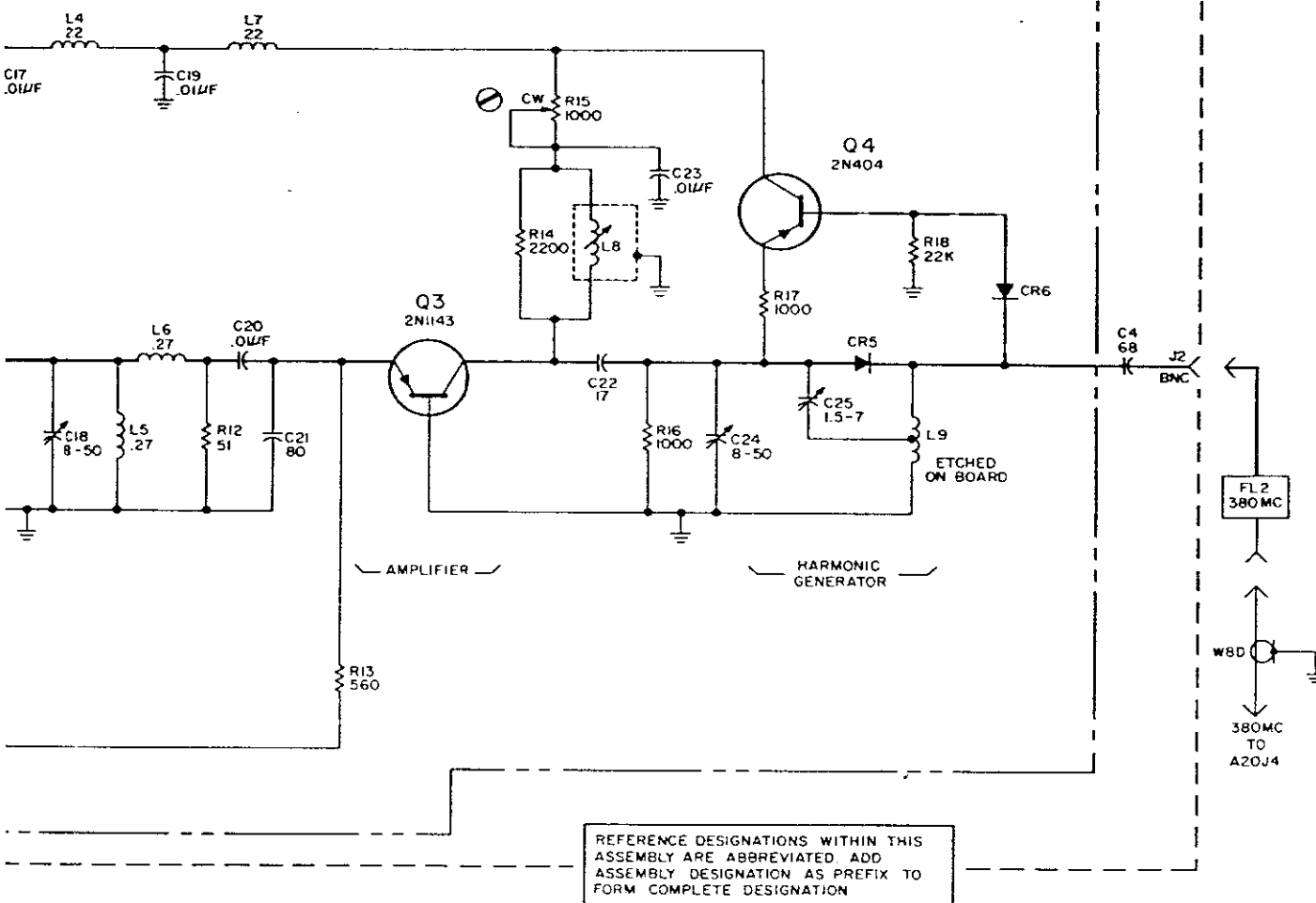


NOTES

1. UNLESS OTHERWISE INDICATED:
RESISTANCE IN OHMS;
CAPACITANCE IN PICOFARADS
INDUCTANCE IN MICROHENRIES

REFERENCE DESIGNATIONS

NO PREFIX	A14	A
FL2	C 1-4 J 1,2	C 1-4 CR 1-4 L 1-4 Q 1-4 R 1-4 T 1-4
W7E, W80		



DESIGNATIONS

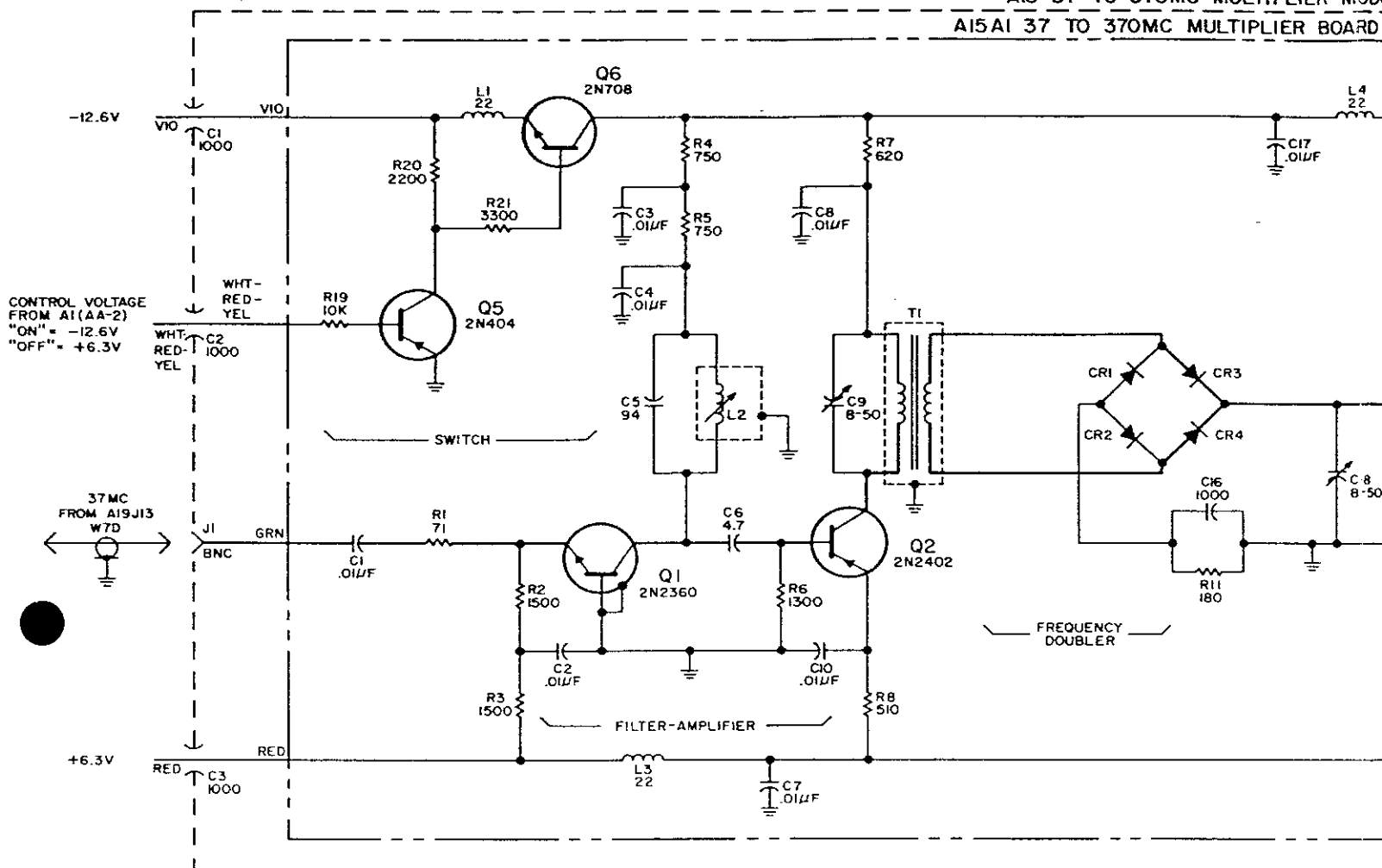
DESIGNATION	ASSEMBLY DESIGNATION
A14	A14A1
C 1-10, 16-25	CR1-6
L 1-9	O 1-6
R 1-8, 11-21	T 1

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05100-0-13

Figure 5-20. 38 to 380 Mc Multiplier A14

A15 37 TO 370MC MULTIPLIER MOD
A15A1 37 TO 370MC MULTIPLIER BOARD

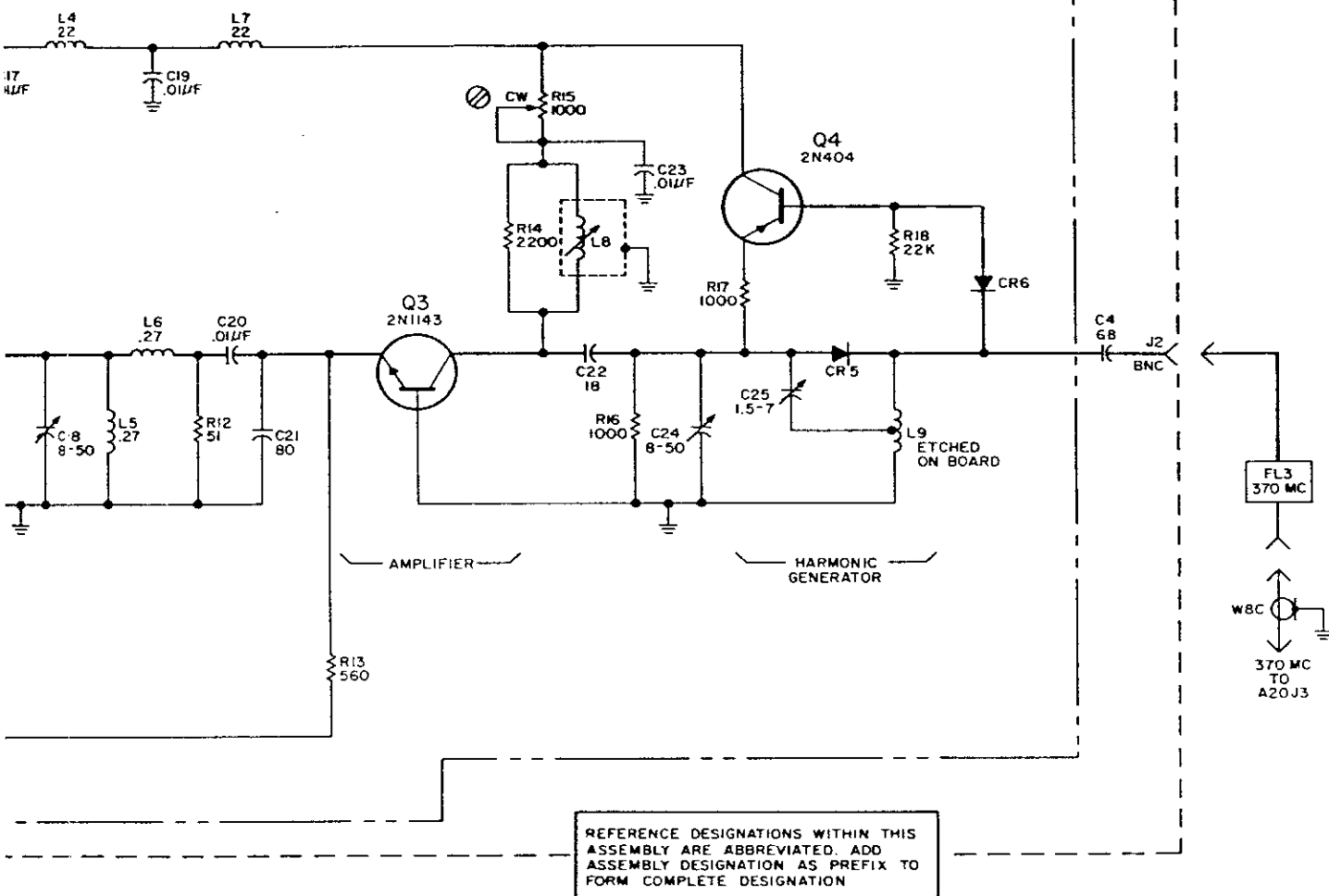


NOTES

- UNLESS OTHERWISE INDICATED:
RESISTANCE IN OHMS
CAPACITANCE IN PICOFARADS
INDUCTANCE IN MICROHENRIES

REFERENCE DESIGNATION

NO PREFIX	A15	
FL3	C1-4 J1,2	C1 R1 T1
W7D, W8C		



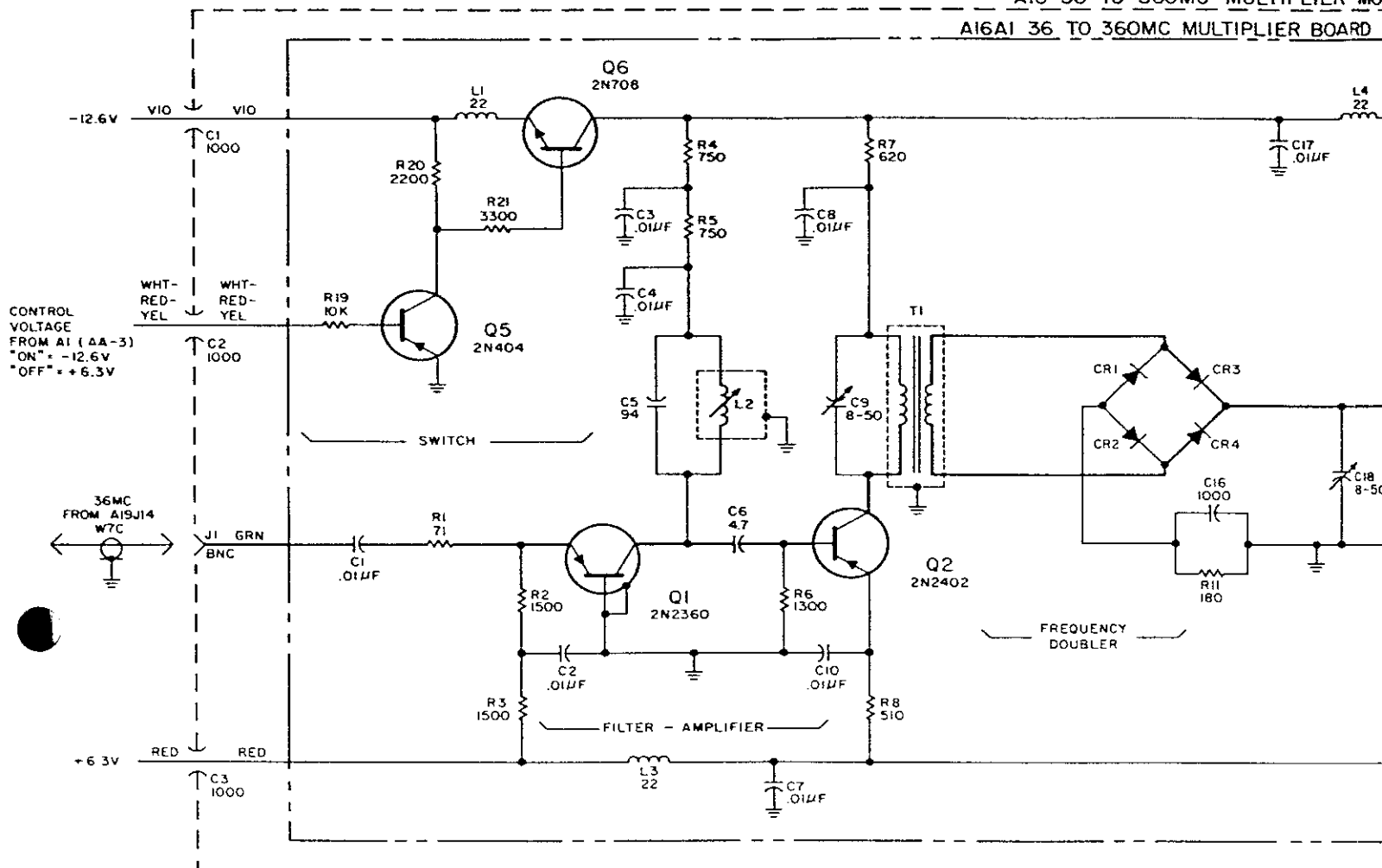
DESIGNATIONS

15	A15A1
16	C1-10, 16-25 CR1-6
17	L1-9 Q1-6 R1-8, 11-21 T1

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05 00101 4

Figure 5-21. 37 to 370 Mc Multiplier Assembly

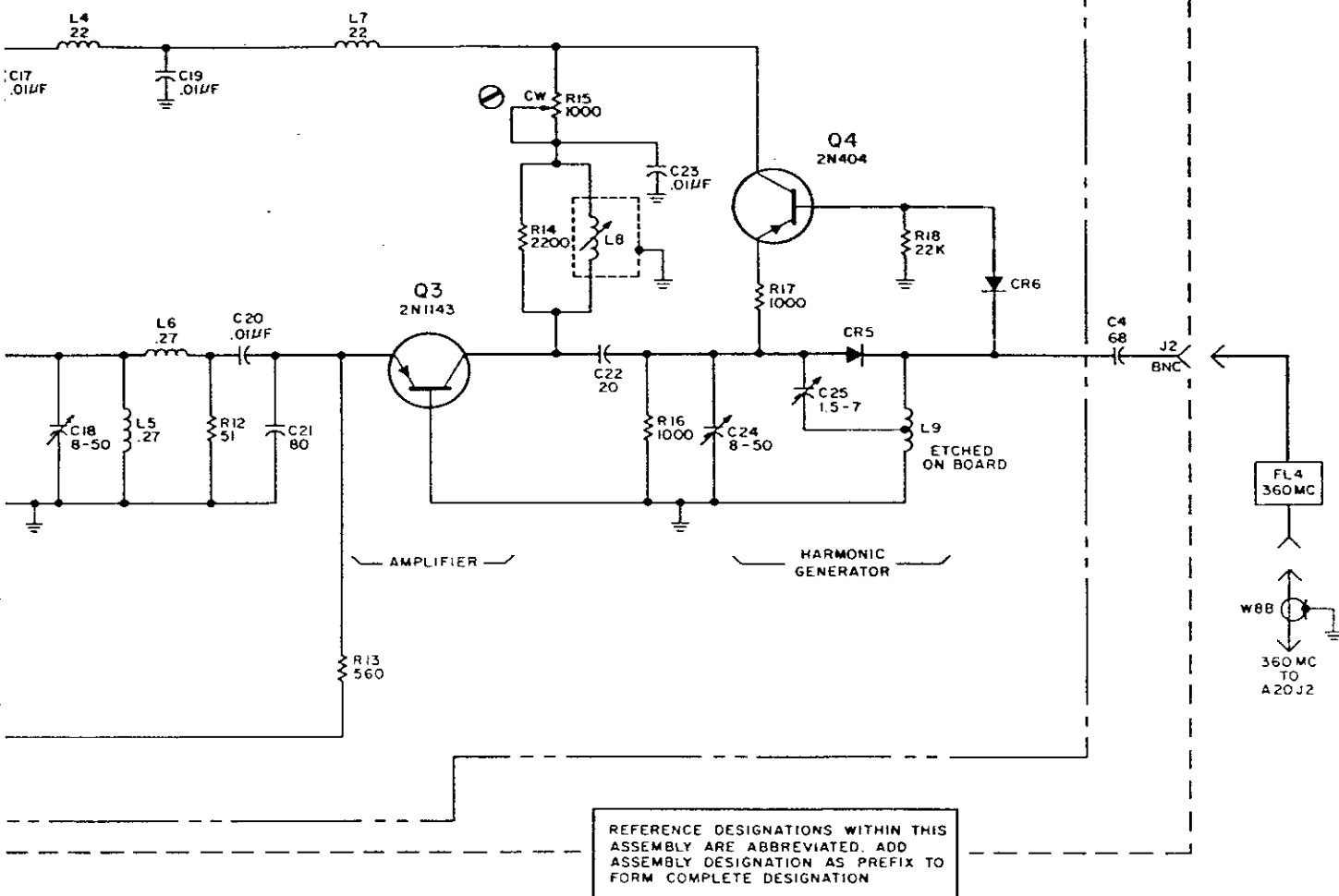


NOTES

1. UNLESS OTHERWISE INDICATED:
RESISTANCE IN OHMS;
CAPACITANCE IN PICO FARADS
INDUCTANCE IN MICROHENRIES

REFERENCE DESIGNATION

NO PREFIX	A16	
FL 4	C1-4	C
	J1,2	L
W7C, W8B		



DESIGNATIONS

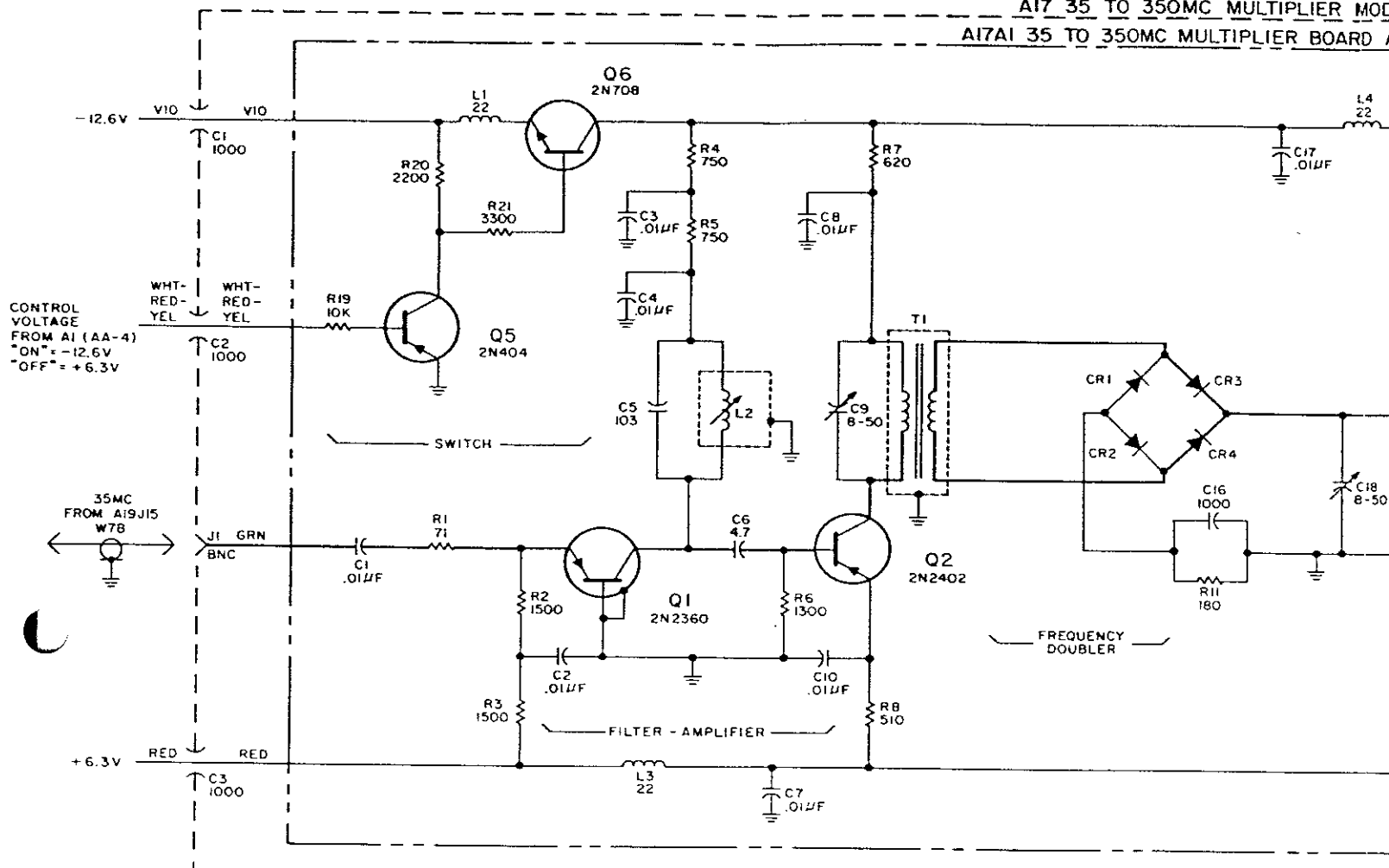
A16	A16A1
1-4	C1-10, 16-25 CR1-6
1,2	L1-9 O1-6 R1-8, 11-21 T1

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01-00-10-15

Figure 5-22. 36 to 360 Mc Multiplier A
5-49/5-

A17 35 TO 350MC MULTIPLIER MOD
A17A1 35 TO 350MC MULTIPLIER BOARD

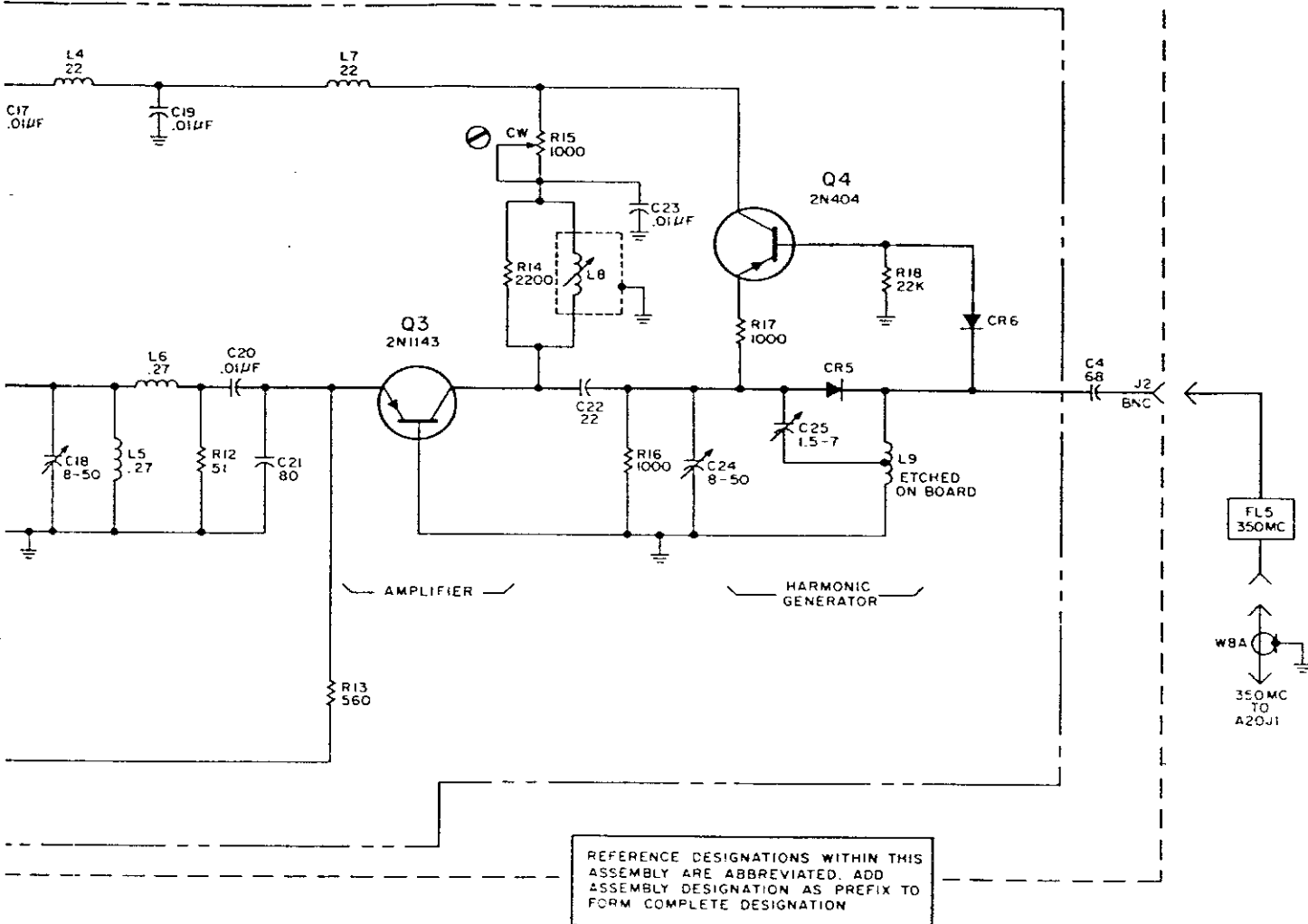


NOTES

1. UNLESS OTHERWISE INDICATED:
RESISTANCE IN OHMS;
CAPACITANCE IN PICOFARADS
INDUCTANCE IN MICROHENRIES

REFERENCE DESIGNATION

NO PREFIX	A17	
FL 5	C 1 - 4	C
	J 1, 2	CR
		L
		Q
		R
		T
W7B, W8A		



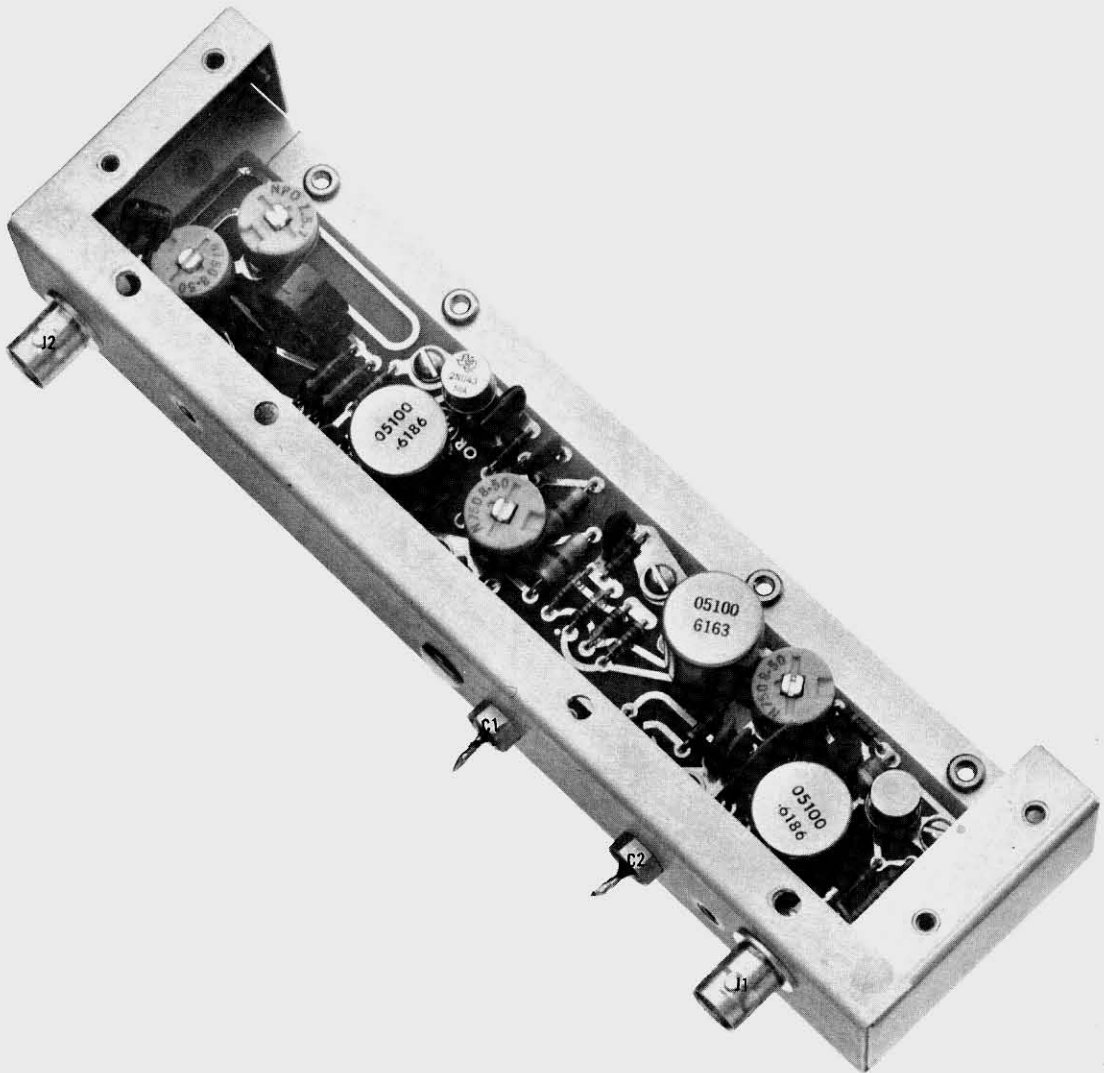
DESIGNATIONS

A17	A:7A1
-4	C1-10, 16-25 CR1-6
.2	L1-9 Q1-6 R1-8, 11-21 T1

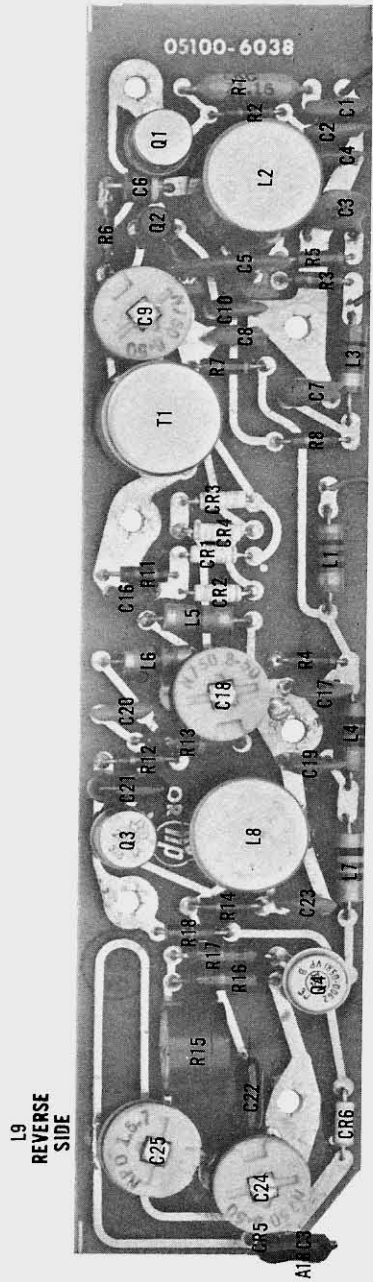
COPYRIGHT 1965 BY HEWLETT-PACKARD COMPANY

05100-6162

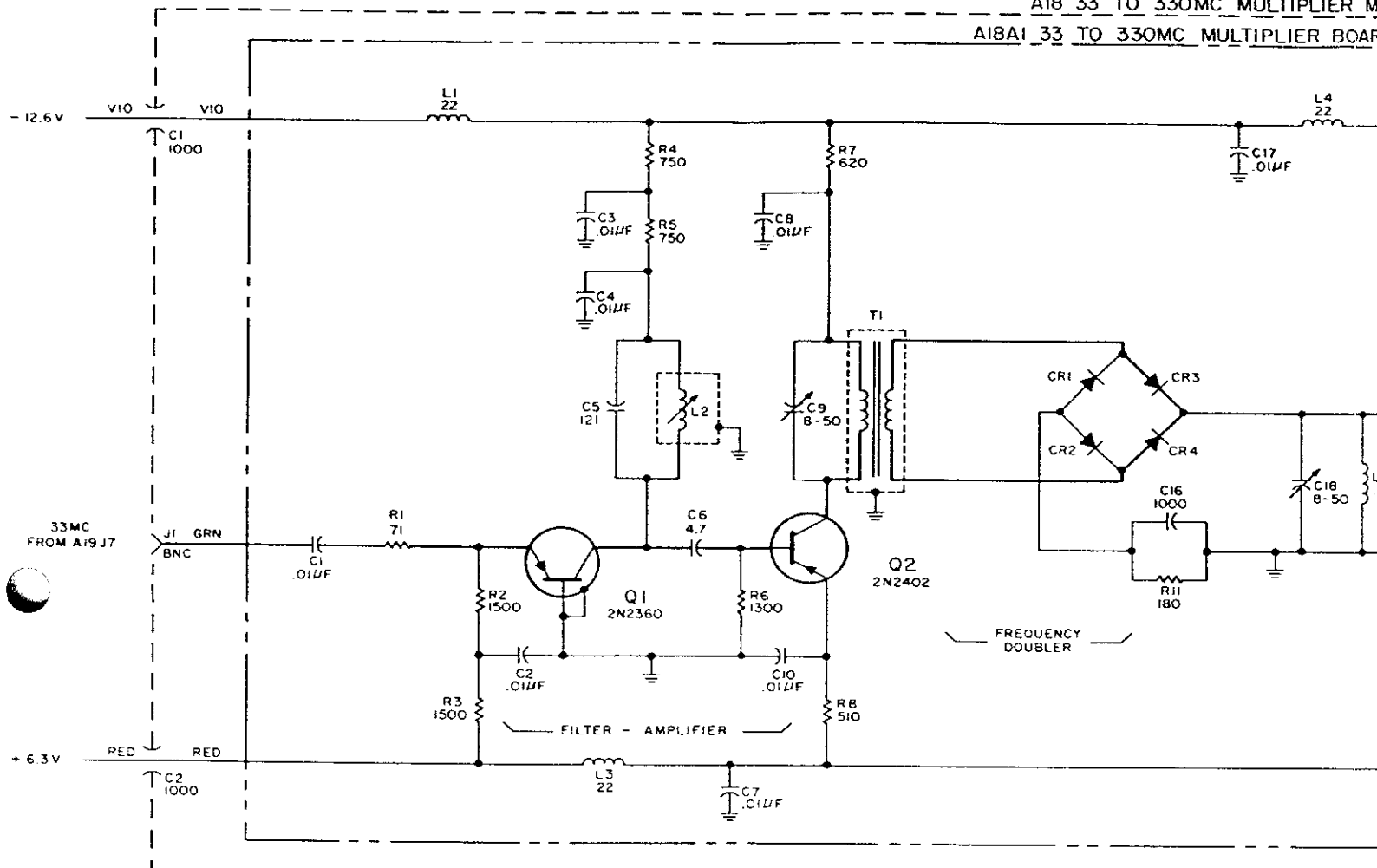
Figure 5-23. 35 to 350 Mc Multiplier A1



A18



A18A1

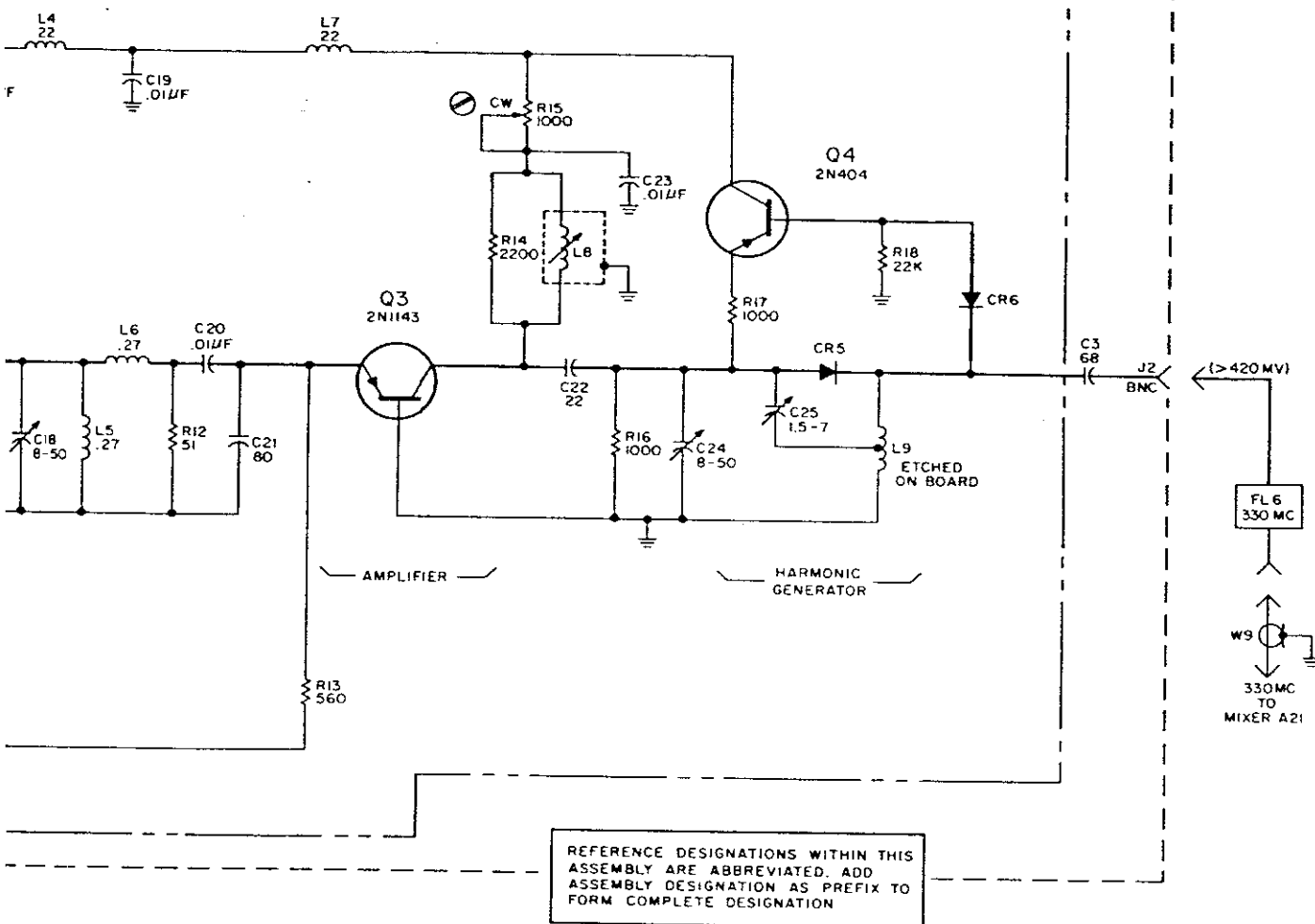


NOTES

1. UNLESS OTHERWISE INDICATED:
RESISTANCE IN OHMS.
CAPACITANCE IN PICOFARADS
INDUCTANCE IN MICROHENRIES

REFERENCE DES GNA

NO PREFIX	A18
FL6	C1-3
W9	J1, 2



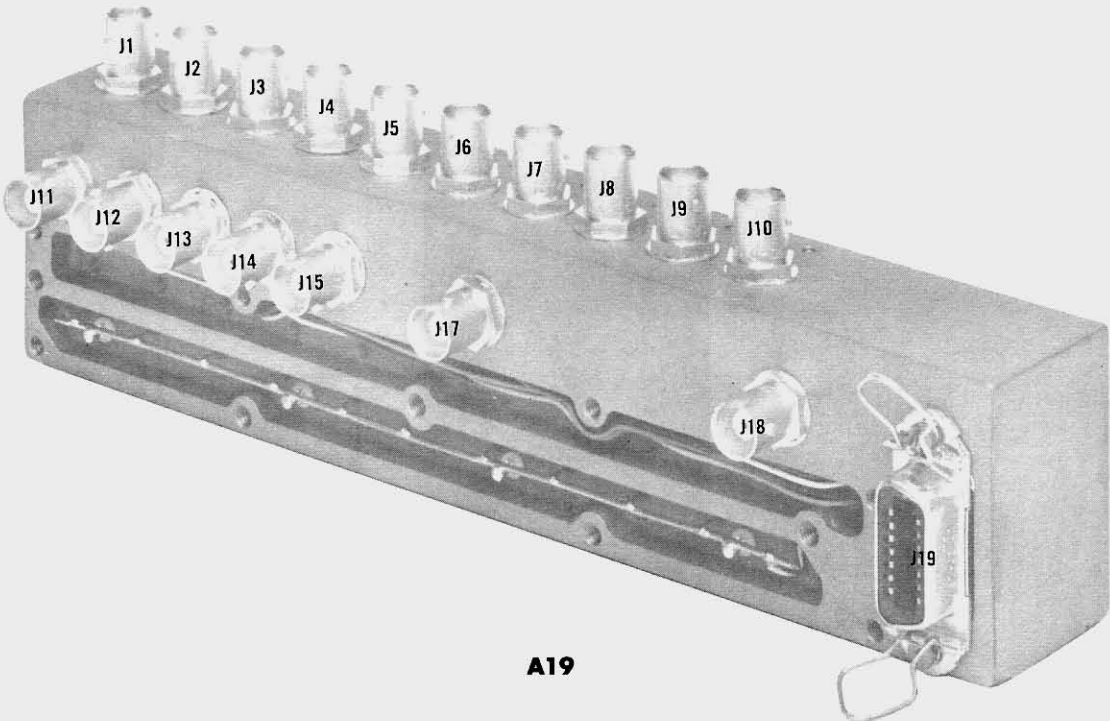
COMPONENT DESIGNATIONS

A/B	A/B A1
C1-3	C1-10, 16-25 CR1-6
J1,2	L1-9 Q1-4 R1-8, 11-18 T1

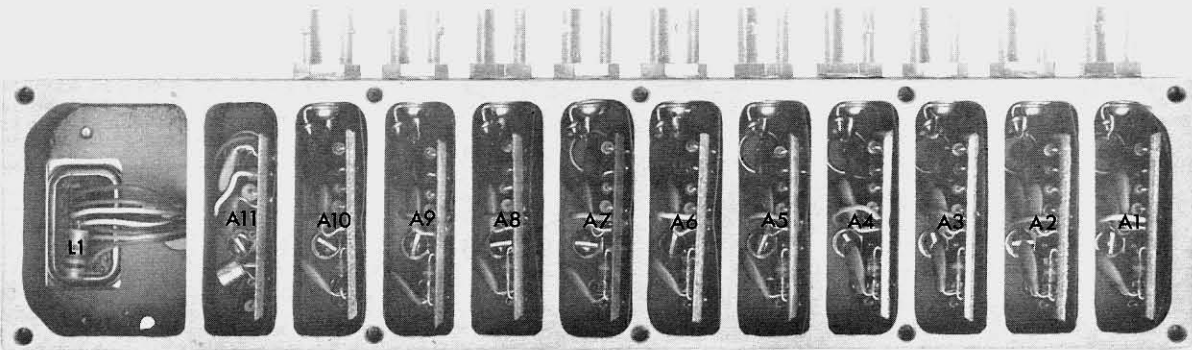
COPYRIGHT 1965 BY HEWLETT-PACKARD COMPANY

05100-D-7

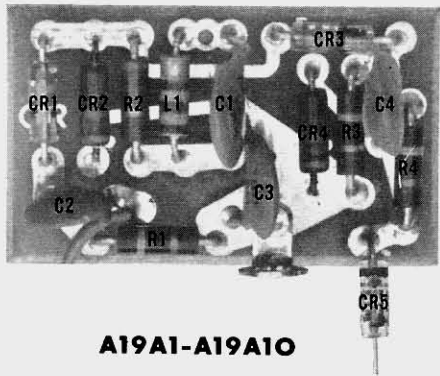
Figure 5-24. 33 to 330 Mc Multiplier Assembly



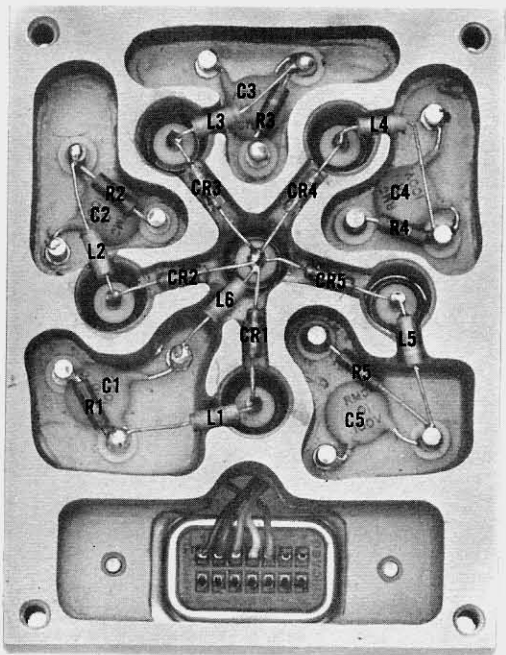
A19



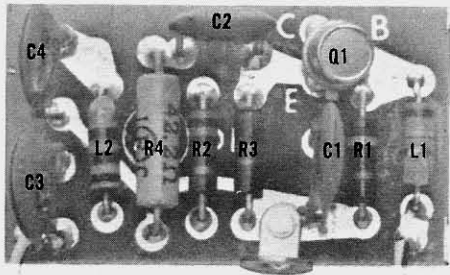
A19



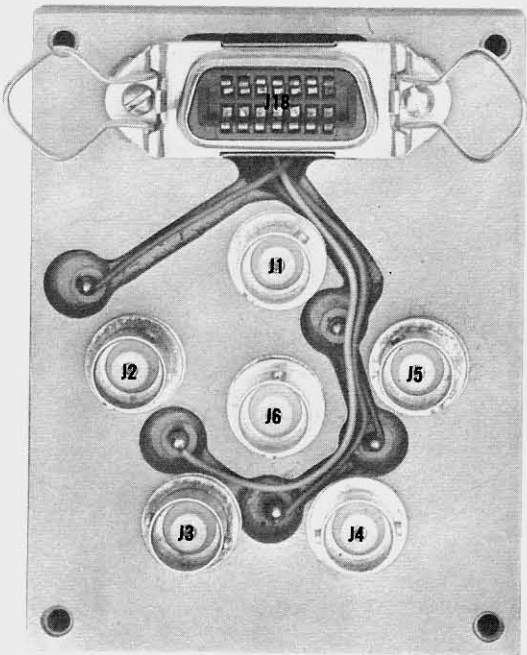
A19A1-A19A10



A20

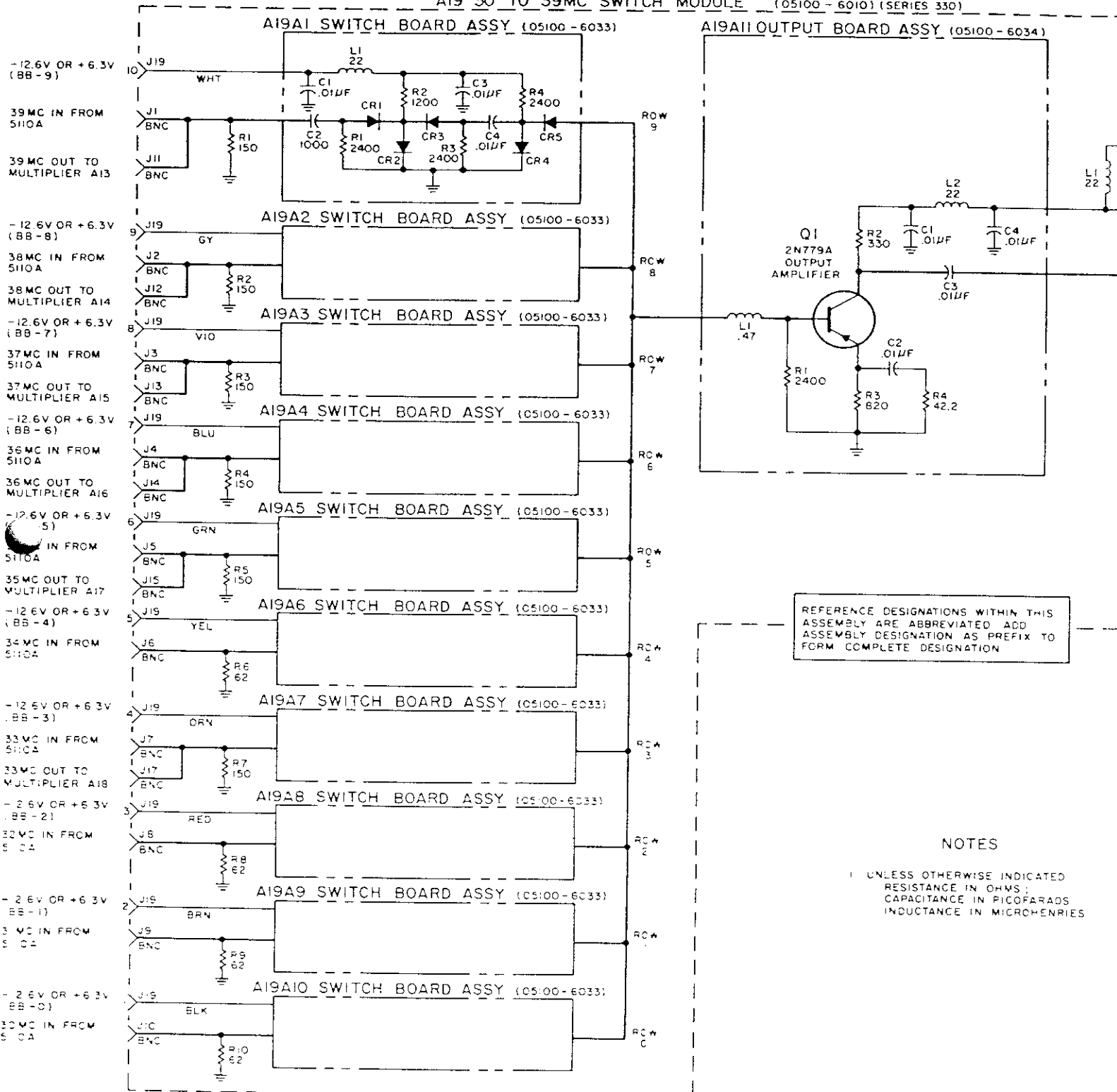


A19A11

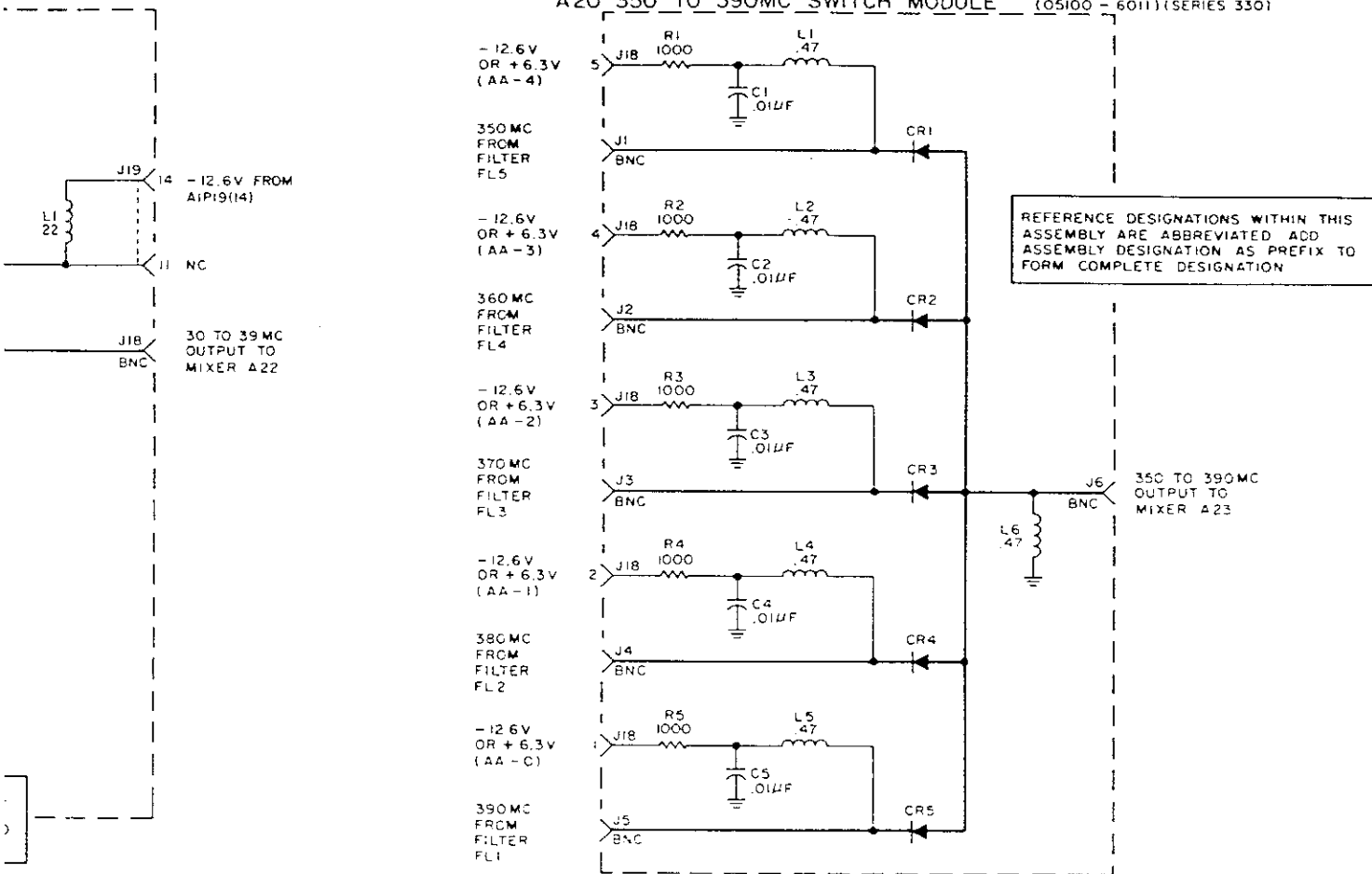


A20

A19 30 TO 39MC SWITCH MODULE (05100 - 6010) (SERIES 330)



A20 350 TO 390MC SWITCH MODULE (05100 - 60111) (SERIES 330)

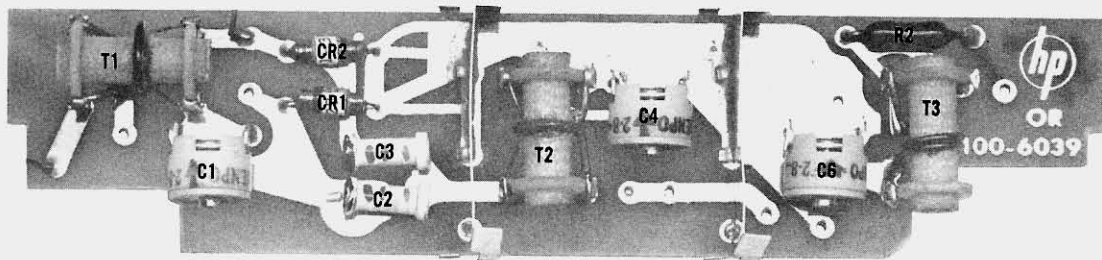


REFERENCE DESIGNATIONS

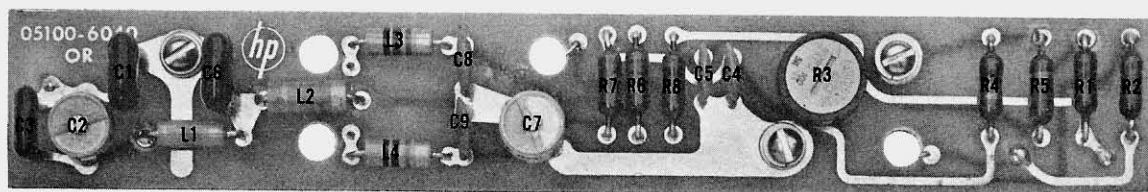
A19	A19A1-A10	A19A11	A20
J1-15, 17-19 L1 P-10	C1-4 CR1-5 L1 R1-4	C1-4 L1,2 C1 R1-4	C1-5 CR1-5 L1-6,18 P1-5

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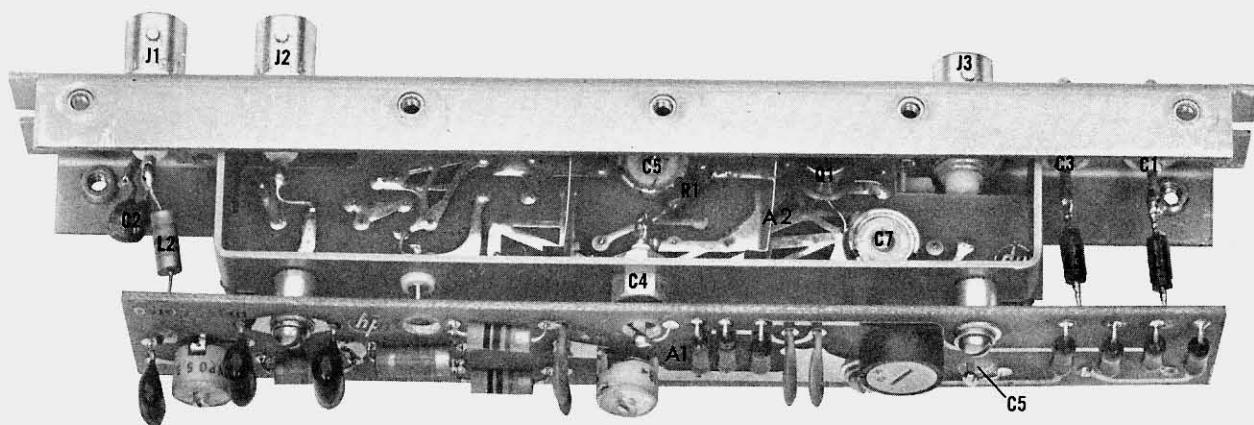
Figure 5-25. 30 to 39 Mc Switch
350 to 390 Mc Switch



A21A2

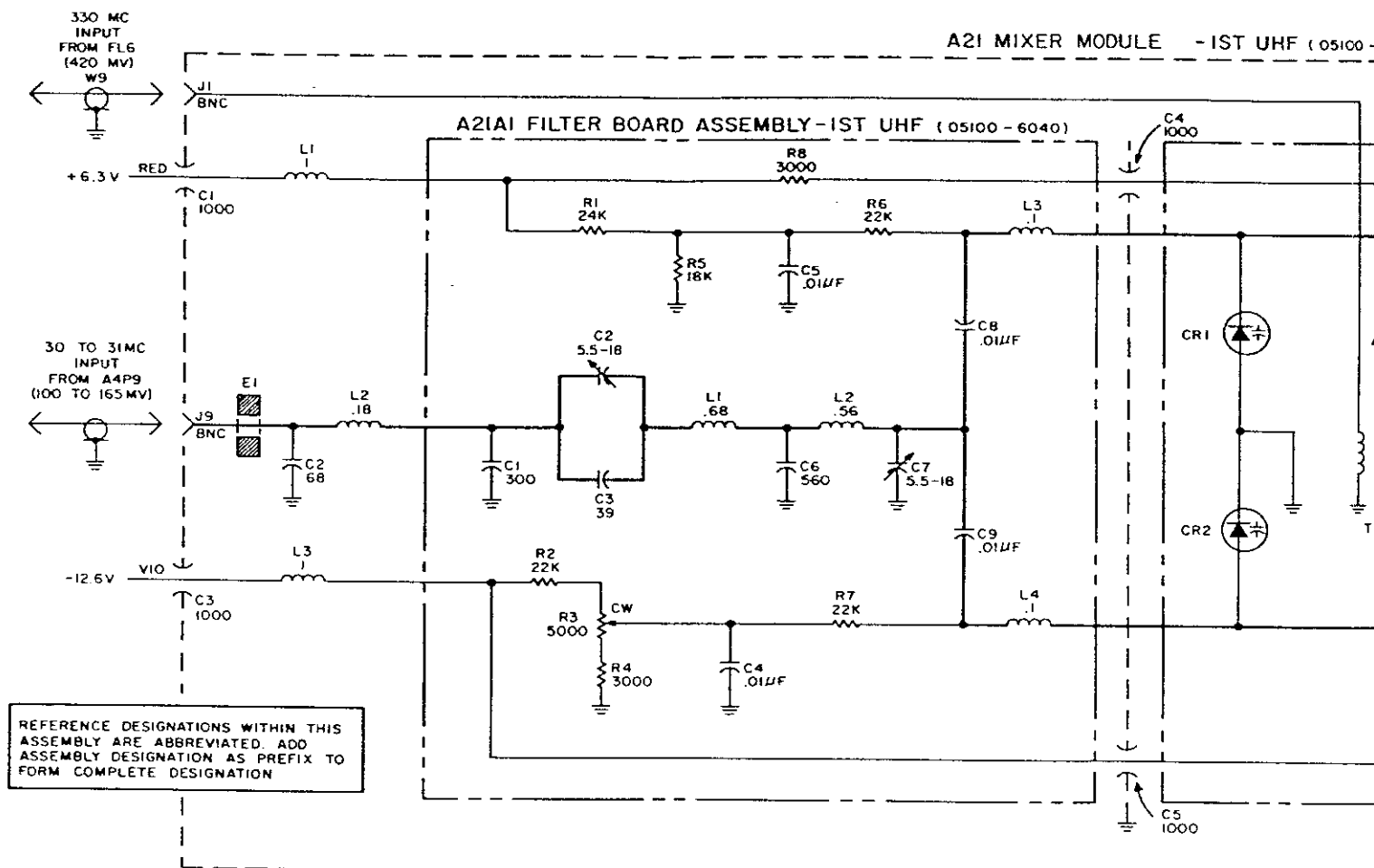


A21A1



A21

A2I MIXER MODULE - 1ST UHF (05100 -



NOTES

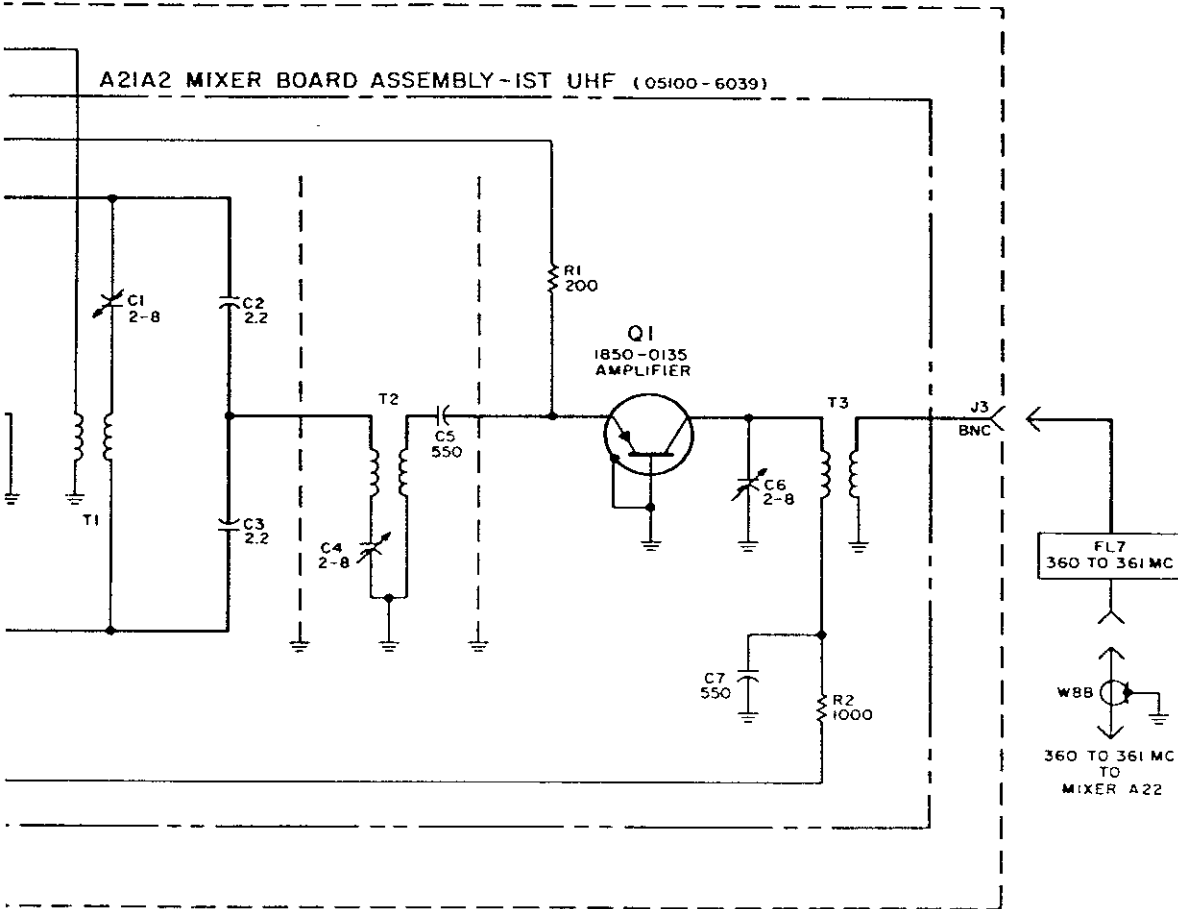
- UNLESS OTHERWISE INDICATED:
RESISTANCE IN OHMS;
CAPACITANCE IN PICOFARADS
INDUCTANCE IN MICROHENRIES

REFERENCE DESIGNATION

NO PREFIX	A2I	A2IAI
FL7	C1-5 E1 J1,3,9 L1-3	C1-9 L1-4 R1-6
W8B, W9		

Section V
Figure 5-26

F (05100 - 6012) (SERIES 401)



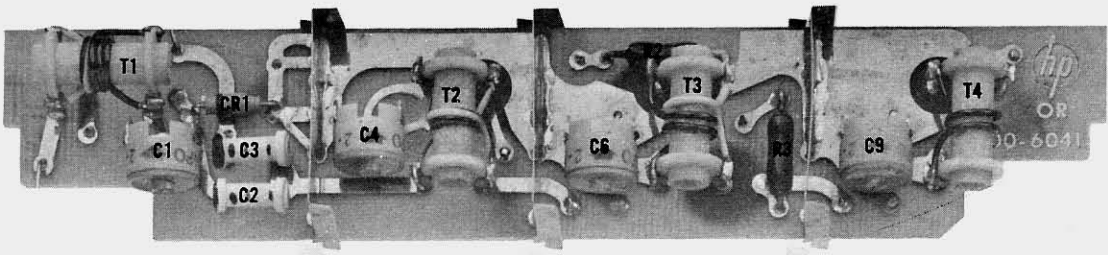
DESIGNATIONS

A21A1	A21A2
C1-9	C1-7 CR1,2
L1-4	Q1 R1,2 T1-3
R1-8	

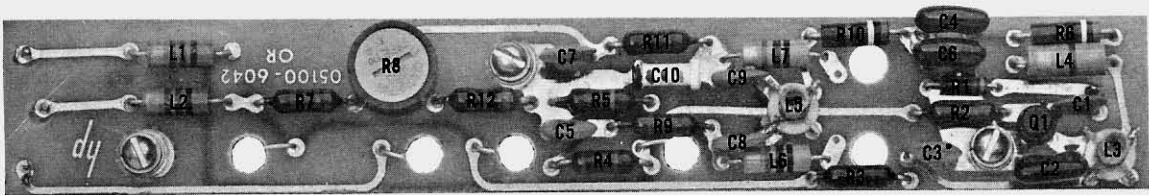
COPYRIGHT 1965 BY HEWLETT-PACKARD COMPANY

C5100 - D - 19

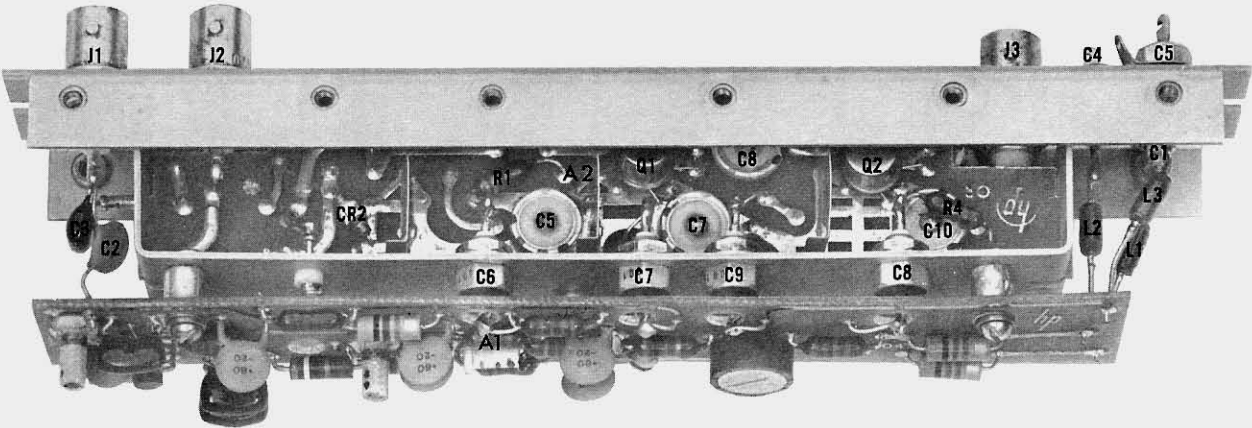
Figure 5-26. 1st UHF Mixer A21
5-57/5-58



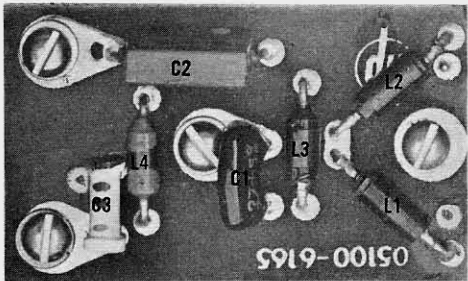
A22A2



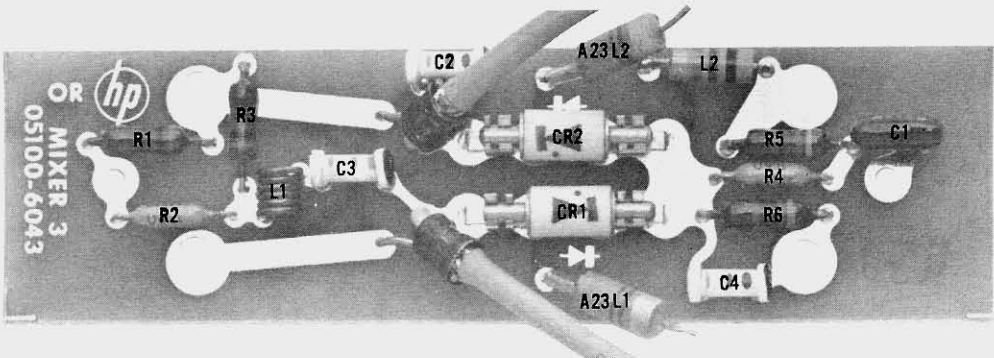
A22A1



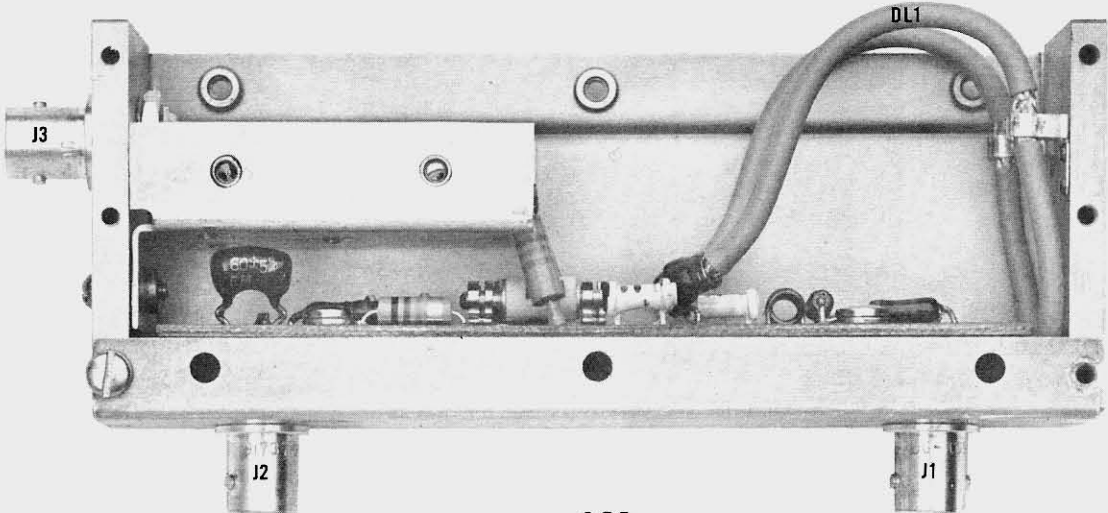
A22



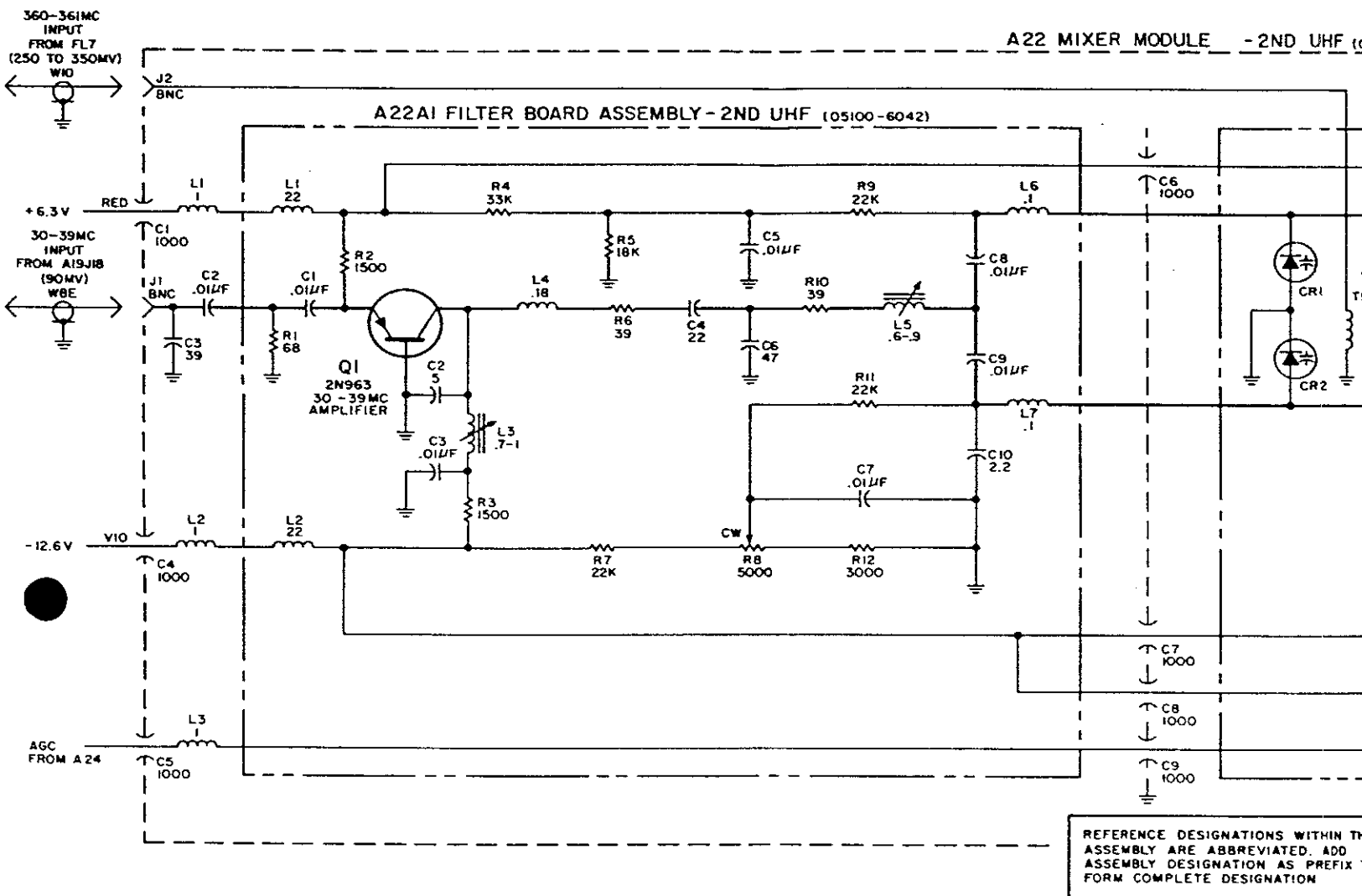
A23A2



A23A1



A23

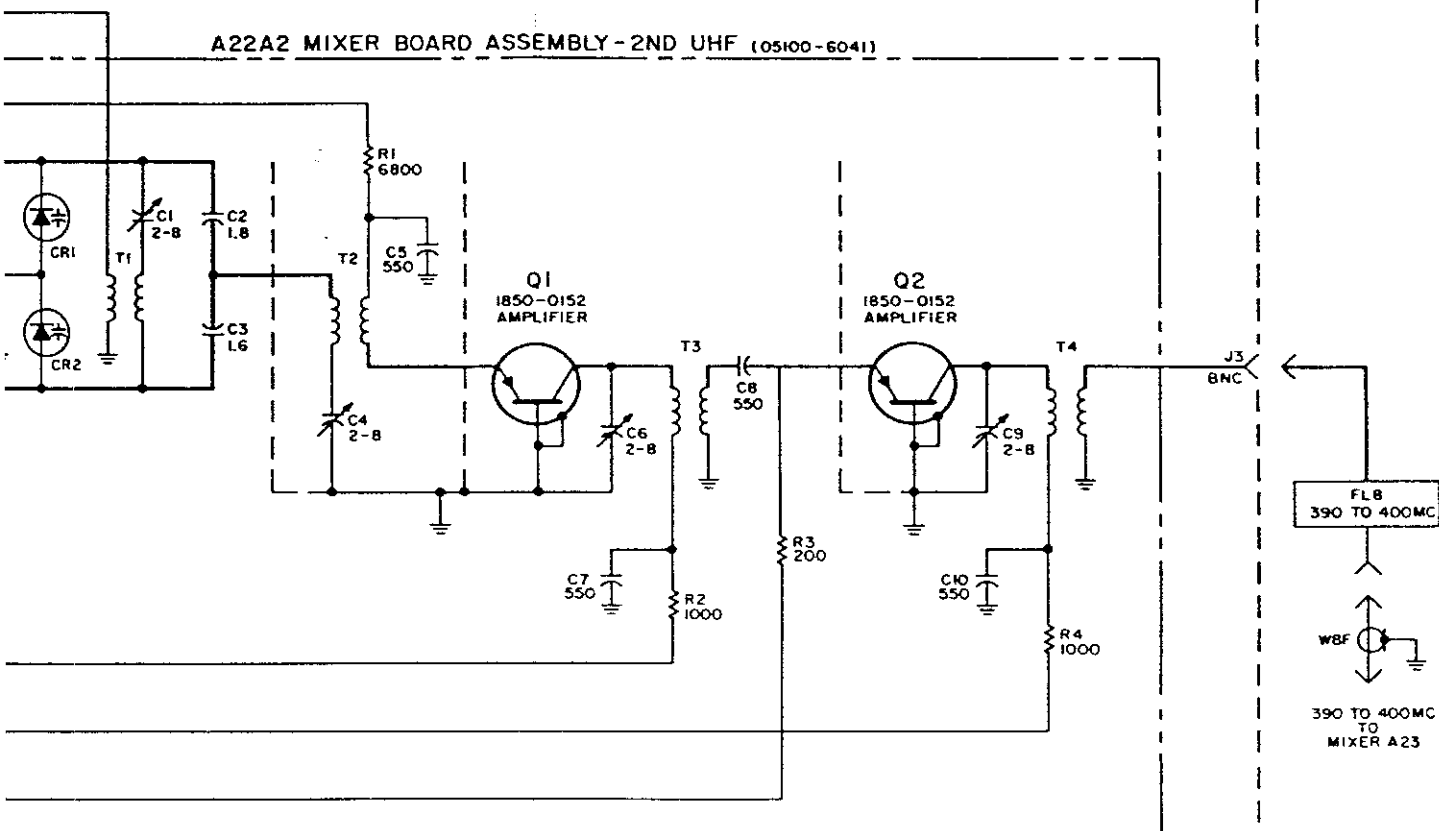


NOTES

1. UNLESS OTHERWISE INDICATED:
RESISTANCE IN OHMS;
CAPACITANCE IN PICO FARADS
INDUCTANCE IN MICROHENRIES

REFERENCE DESIGNATIONS

NO PREFIX	A22	A22A1	
FLB	C1-9 J1-3 L1-3	C1-10 L1-7 Q1 R1-12	C C1 Q R T
WBE, 8F, 10			



COMPONENTS WITHIN THIS
DIAGRAM. ADD
PART NUMBER AS PREFIX TO
IDENTIFICATION

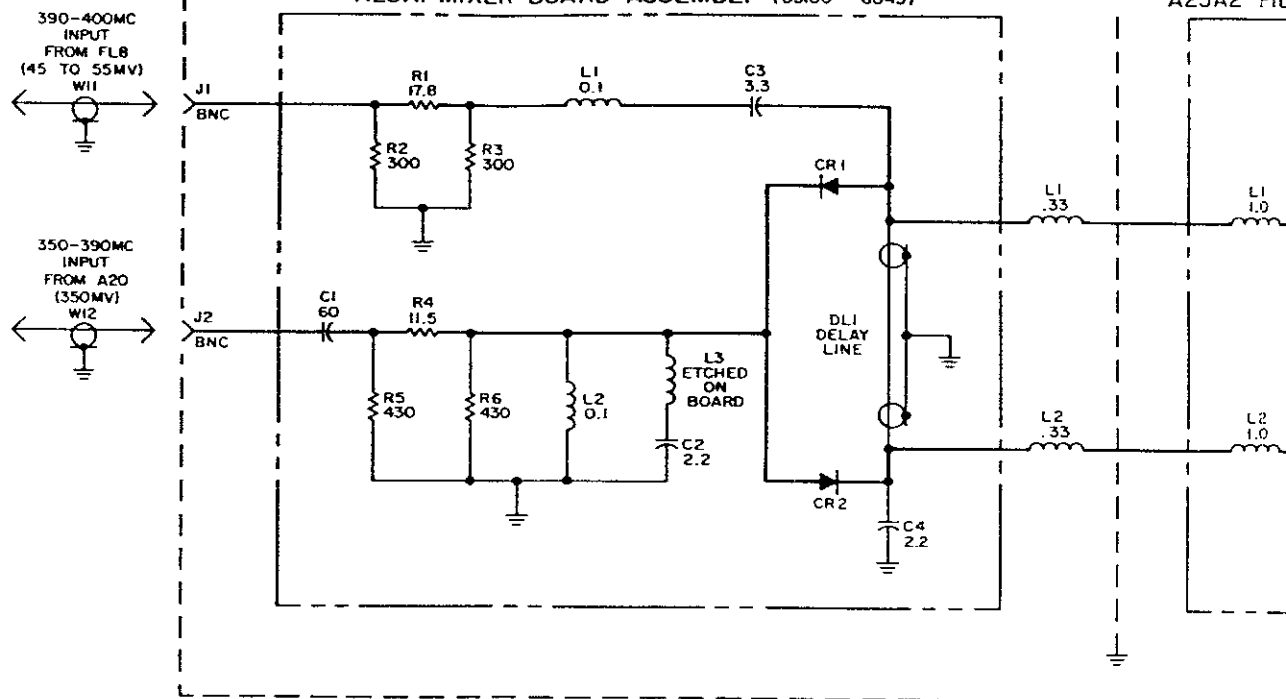
IDENTIFICATIONS

A22A1	A22A2
C1-10	C1-10 CR1,2
Q1-7	Q1,2
R1-12	R1-4 T1-4

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05100-D-20

Figure 5-27. 2nd UHF Mixer



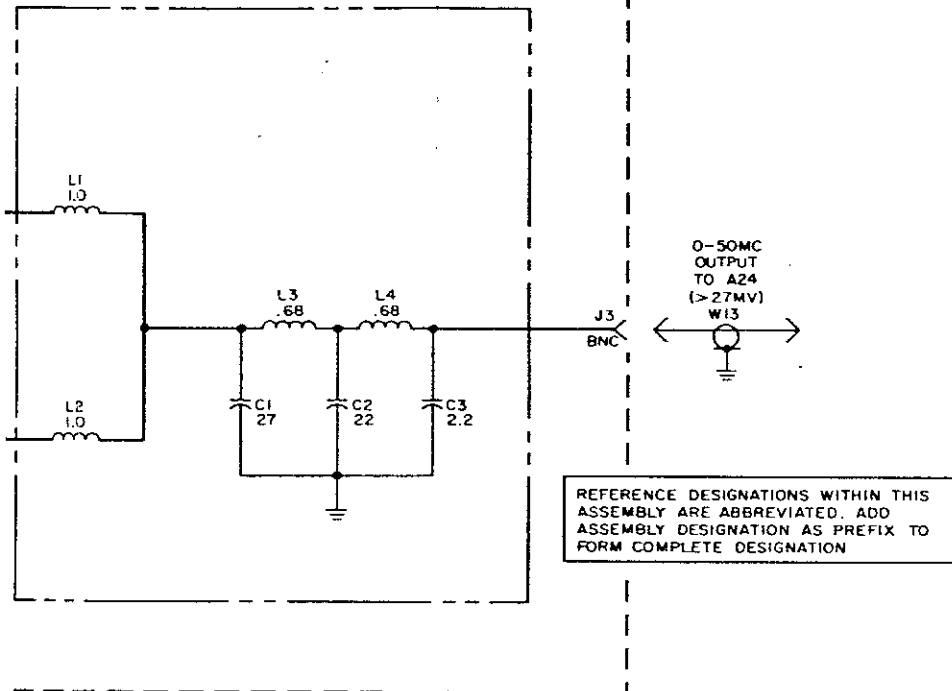
NOTES

1. UNLESS OTHERWISE INDICATED:
 RESISTANCE IN OHMS;
 CAPACITANCE IN PICO FARADS
 INDUCTANCE IN MICROHENRIES

REFERENCE DESIGNATIONS

NO PREFIX	A23	A23A1	A23A2
		C1 - 4 CR1,2 DL1	C1 - 3
	J1 - 3 L1 - 2	L1 - 3 R1 - 6	L1 - 4
W11-13			

A23A2 FILTER BOARD ASSEMBLY (05100 - 6165)



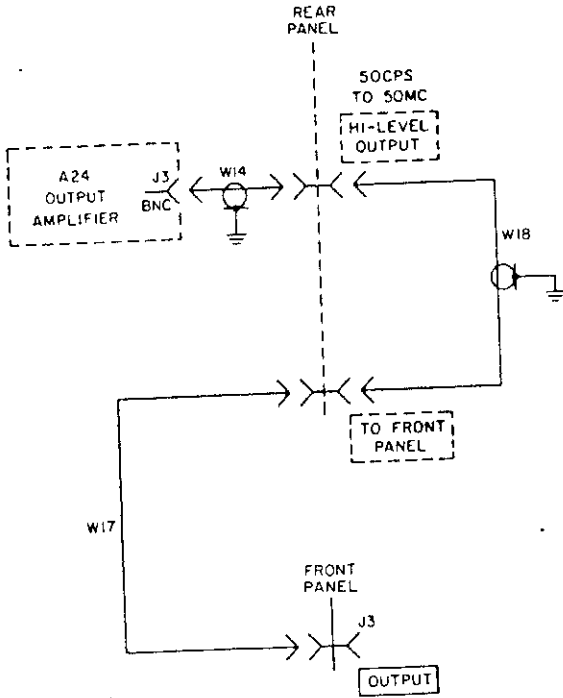
NS

A23A2
C1 - 3
L1 - 4

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05:00 - D - 21

Figure 5-28. 3rd UHF Mixer A23



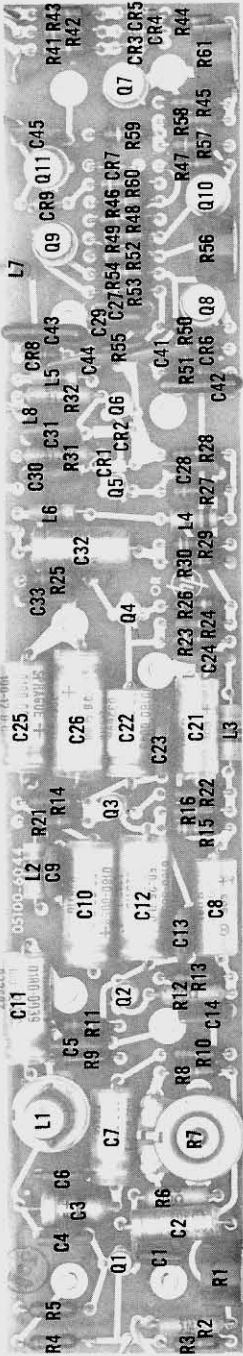
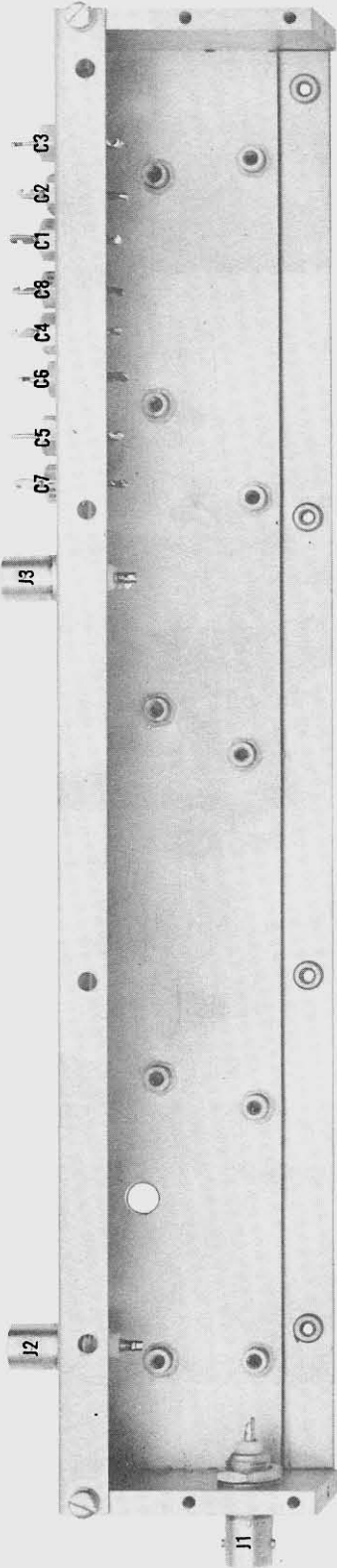
NOTES

- 1. UNLESS OTHERWISE INDICATED:
RESISTANCE IN OHMS;
CAPACITANCE IN PICO FARADS
INDUCTANCE IN MICROHENRIES
- 2. ASTERISK (*) INDICATES
SELECTED COMPONENT,
AVERAGE VALUES SHOWN

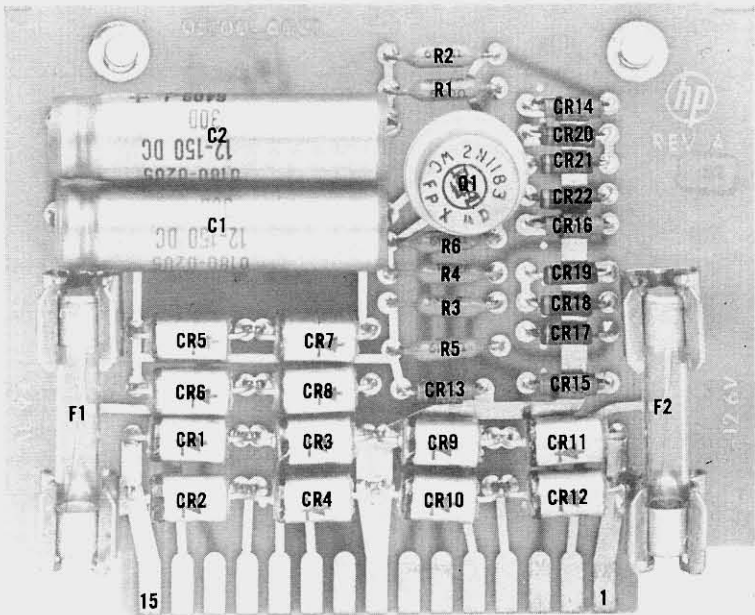
REFERENCE DESIGNATIONS

A24	A24A1
C1-8	C1-14, 21-33, 41-45 CR1-9
J1-3	L1-8 O1-11 R1-16, 21-32, 41-61

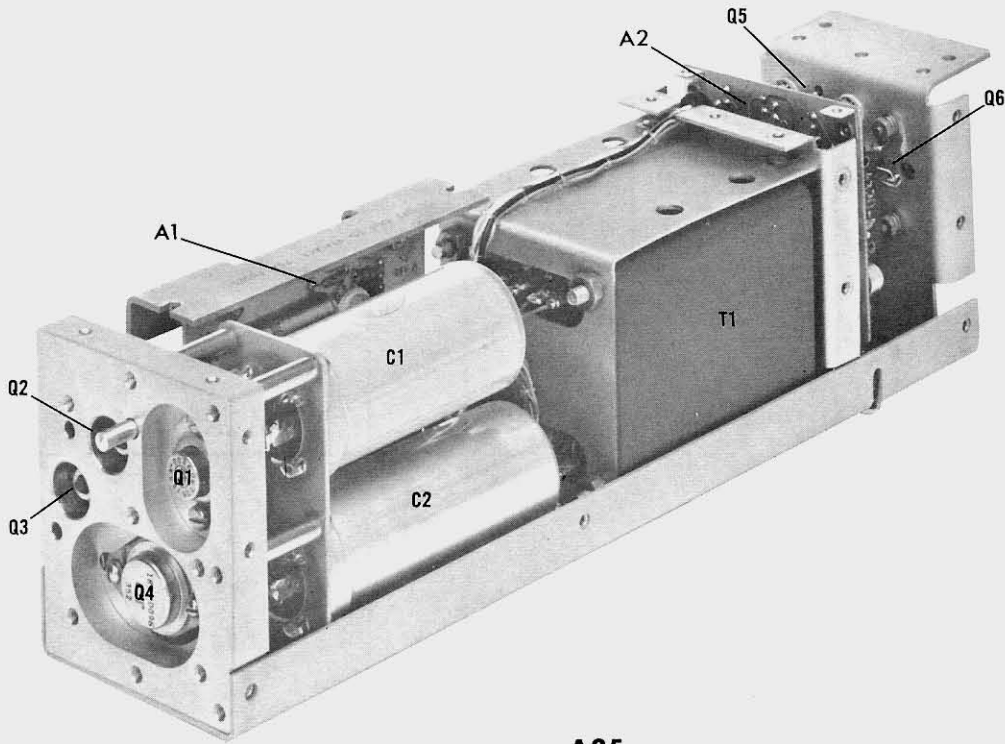
DS100-D-22



A24



A25A1



A25

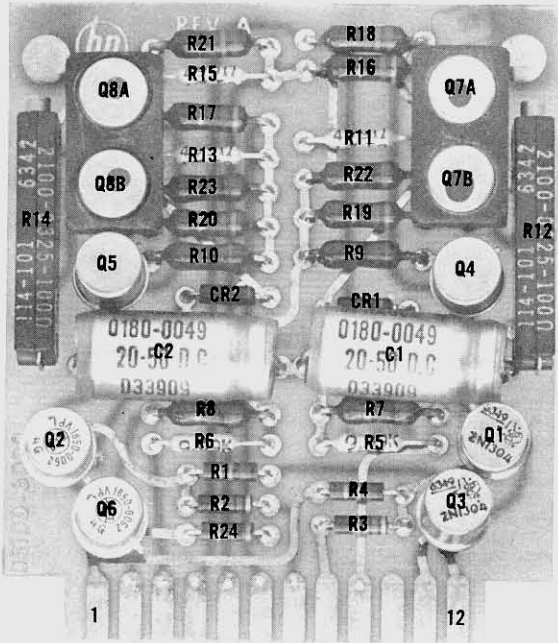
NOTES

- I. UNLESS OTHERWISE INDICATED:
RESISTANCE IN OHMS;
CAPACITANCE IN PICOFARADS

REFERENCE DESIGNATIONS

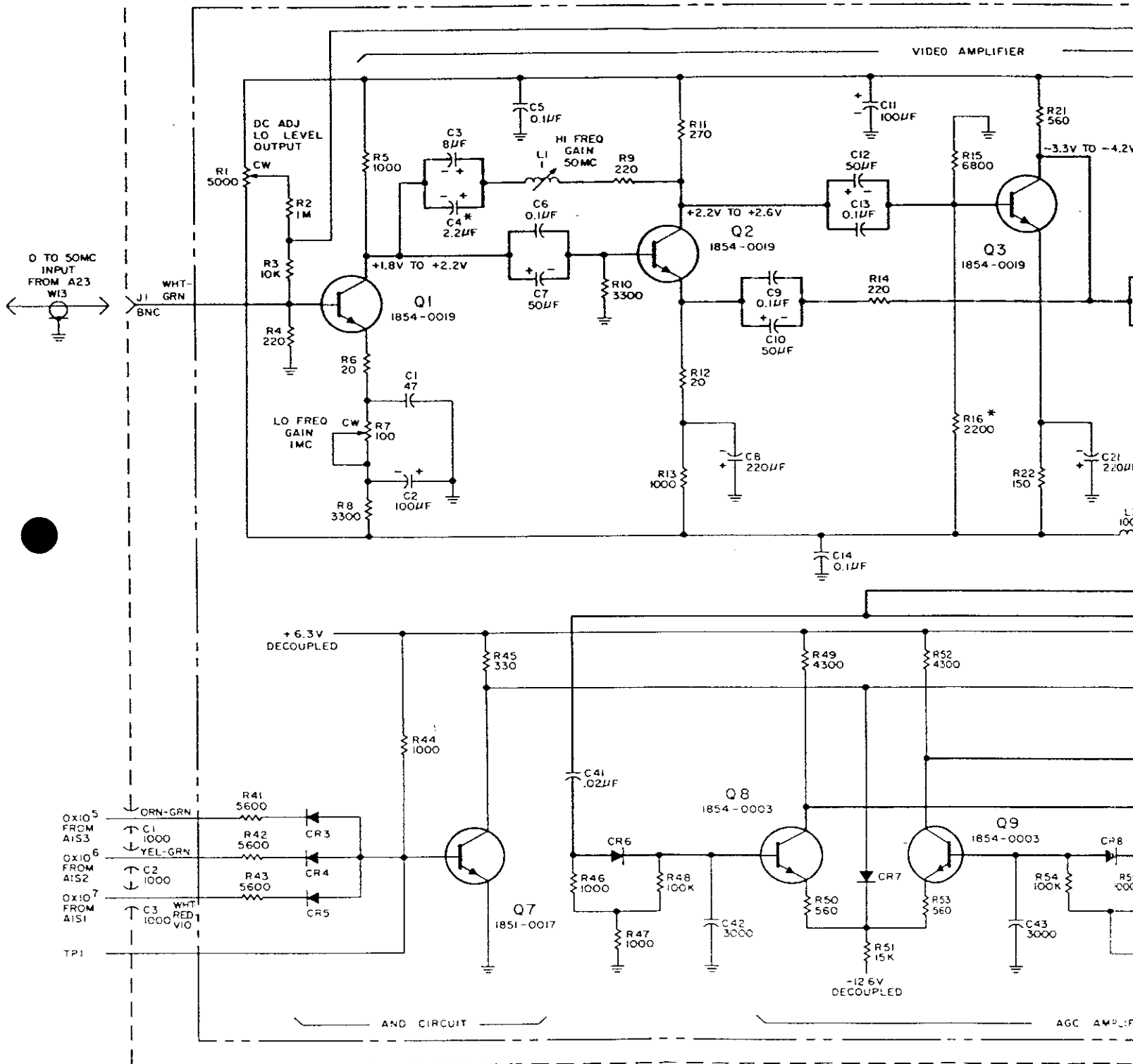
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DS1 F1 J12,13,14	C1-4	C1,2 CR1-22 F1,2	C1,2 CR1,2	C1	C1
R1 S4,5 W1	P2,3 Q1-6 R1,2 T1	Q1 R1-6	Q1-8 R1-24	L1	L1

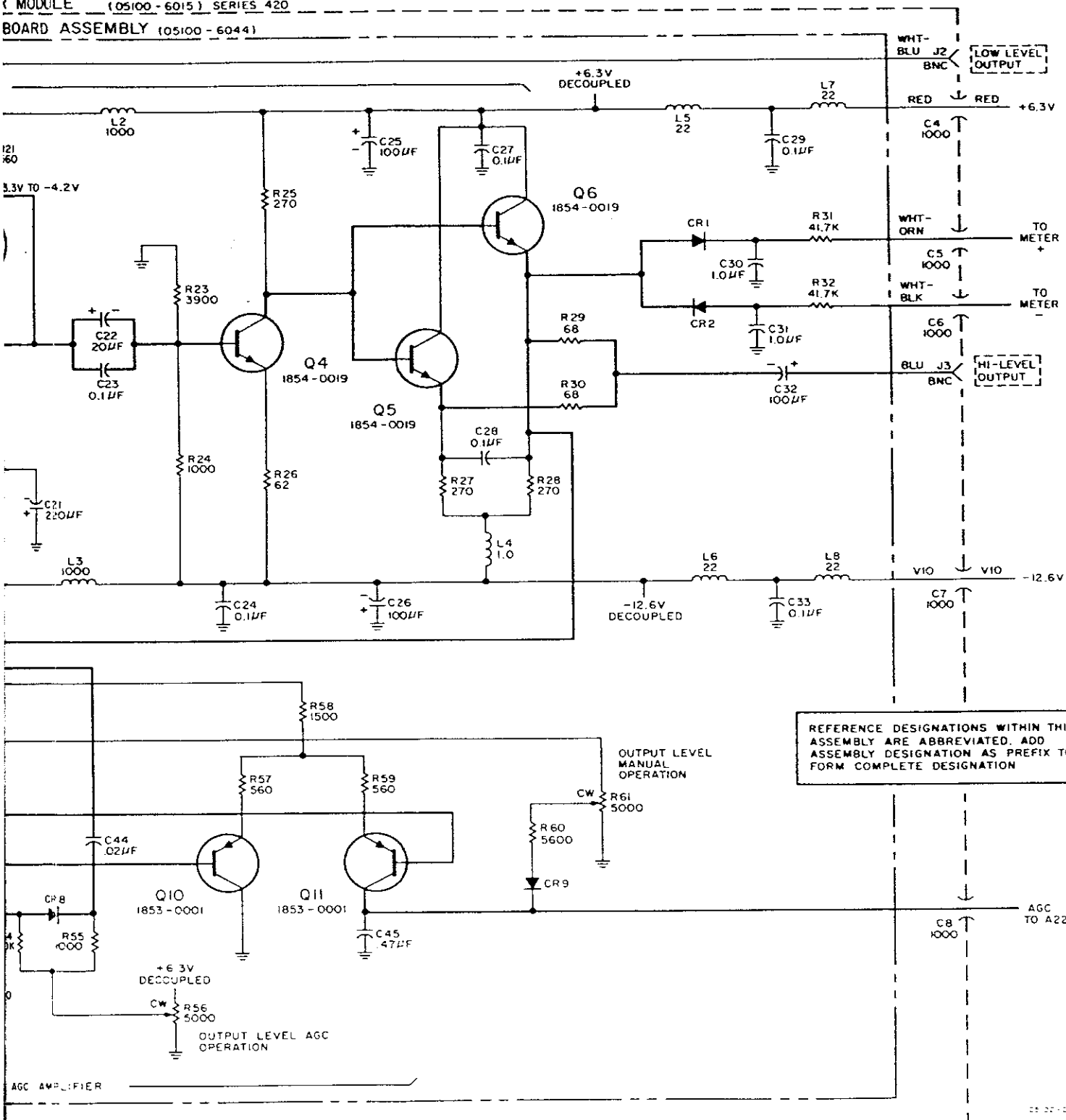
05100-D-24



A25A2

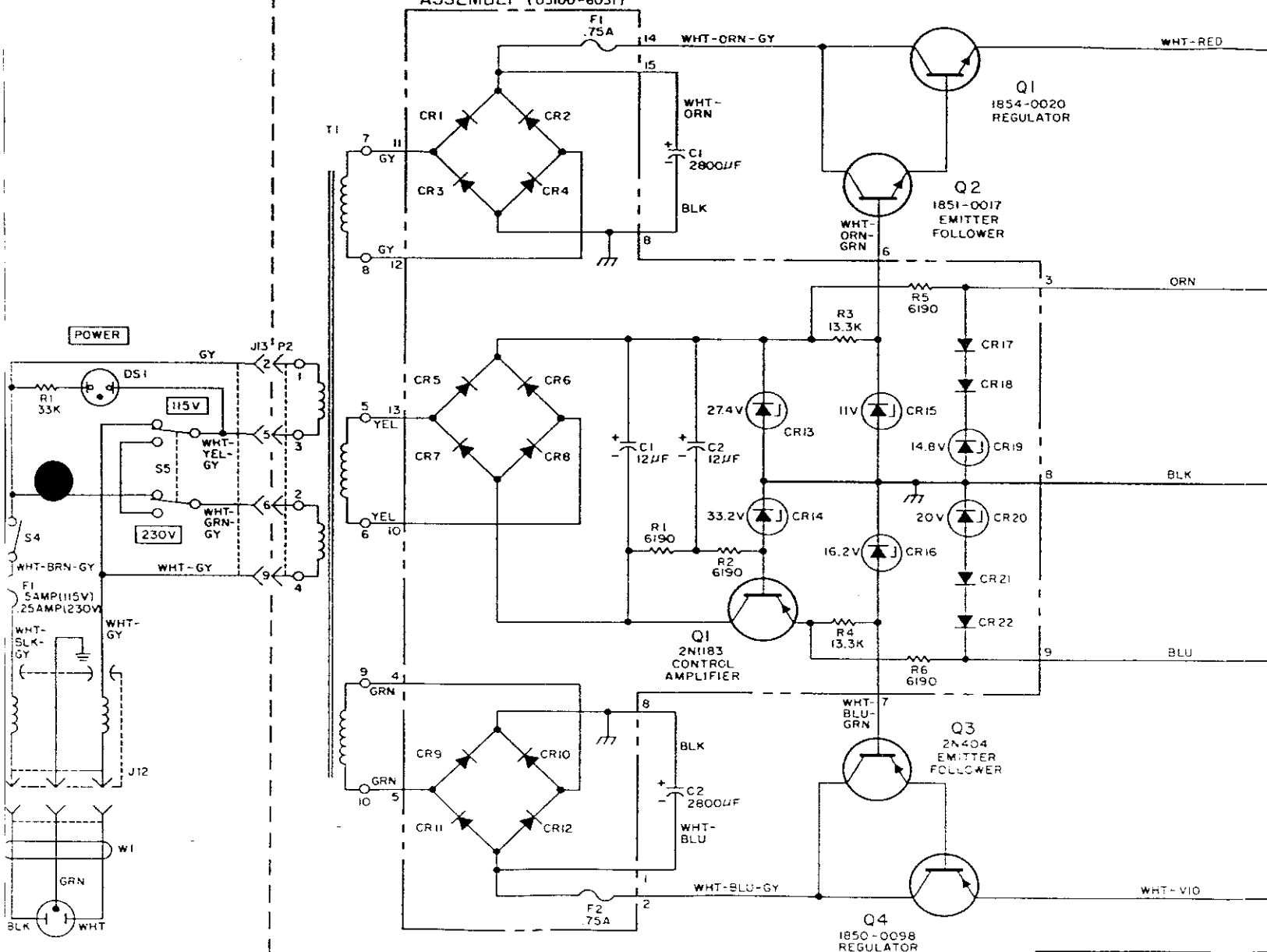
A24 OUTPUT AMPLIFIER MODULE A24AI OUTPUT AMPLIFIER BOARD AS





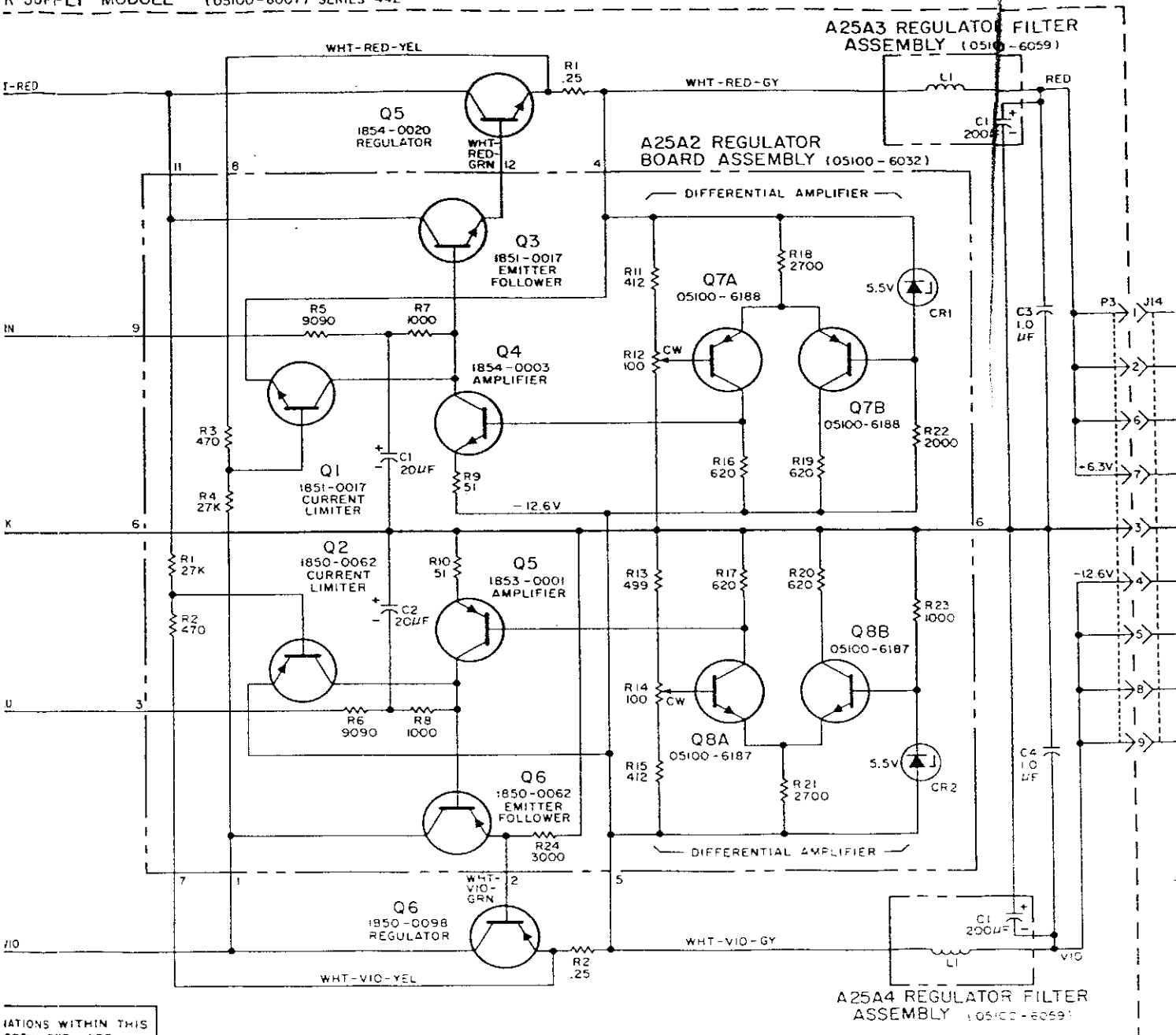
CS 20-10-123

A25AI RECTIFIER BOARD
ASSEMBLY (05100-6031)



REFERENCE DESIGNATIONS WITH
ASSEMBLY ARE ABBREVIATED.
ASSEMBLY DESIGNATION AS PR
FORM COMPLETE DESIGNATION

R SUPPLY MODULE (05100-6007) SERIES 442



ATIONS WITHIN THIS
BREVATED, ADD
ATION AS PREFIX TO
DESIGNATION

ETT-PACKARD COMPANY

1A-10-13-125

Figure 5-30. Power Supply

SECTION VI

REPLACEABLE PARTS

6-1. INTRODUCTION.

6-2. This section contains information for ordering replacement parts. Table 6-1 through 6-20 lists parts in alpha-numerical order of their reference designators and indicates the description and ϕ stock number of each part, together with any applicable notes. Table 6-21 lists parts in alpha-numerical order of ϕ stock number and provides the following information on each part:

- a. Description of the part (see list of abbreviations below).
- b. Typical manufacturer of the part in a five-digit code; see list of manufacturers in Table 6-22.
- c. Manufacturer's part number.
- d. Total quantity used in the instrument (TQ column).

6-3. Miscellaneous parts are listed at the end of Tables 6-1 through 6-20.

6-4. ORDERING INFORMATION.

6-5. To obtain replacement parts, address order or inquiry to your local Hewlett-Packard Field Office (see lists at rear of this manual for addresses). Identify parts by their Hewlett-Packard stock numbers.

6-6. To obtain a part that is not listed, include:

- a. Instrument model number.
- b. Instrument serial number.
- c. Description of the part.
- d. Function and location of the part.

REFERENCE DESIGNATORS

A	= assembly	E	= misc electronic part	MP	= mechanical part	TB	= terminal board
B	= motor	F	= fuse	P	= plug	TP	= test point
BT	= battery	FL	= filter	Q	= transistor	V	= vacuum, tube, neon bulb, photocell, etc.
C	= capacitor	J	= jack	R	= resistor	W	= cable
CP	= coupler	K	= relay	RT	= thermistor	X	= socket
CR	= diode	L	= inductor	S	= switch	Y	= crystal
DL	= delay line	M	= meter	T	= transformer		
DS	= device signaling (lamp)						

ABBREVIATIONS

A	= amperes	GE	= germanium	N/C	= normally closed	RMO	= rack mount only
A. F. C.	= automatic frequency control	GL	= glass	NE	= neon	RMS	= root-mean square
AMPL	= amplifier	GRD	= ground(ed)	NI PL	= nickel plate	RWV	= reverse working voltage
B. F. O.	= beat frequency oscillator	H	= henries	N/O	= normally open	S-B	= slow-blow
BE CU	= beryllium copper	HEX	= hexagonal	NPO	= negative positive zero (zero temperature coefficient)	SCR	= screw
BH	= binder head	HG	= mercury	NRFR	= not recommended for field replacement	SE	= selenium
BP	= bandpass	HR	= hour(s)	NSR	= not separately replaceable	SECT	= section(s)
BRS	= brass	IF	= intermediate freq	OB	= order by description	SEMICON	= semiconductor
BWO	= backward wave oscillator	IMPG	= impregnated	OH	= oval head	SI	= silicon
CCW	= counter-clockwise	INCD	= incandescent	OX	= oxide	SIL	= silver
CER	= ceramic	INCL	= include(s)	P	= peak	SL	= slide
CMO	= cabinet mount only	INS	= insulation(ed)	PC	= printed circuit	SPL	= special
COEF	= coefficient	DNT	= internal	PF	= picofarads = 10^{-12} farads	SST	= stainless steel
COM	= common	K	= kilo = 1000	PH BRZ	= phosphor bronze	SR	= split ring
COMP	= composition	LIN	= linear taper	PHL	= Phillips	STL	= steel
CONN	= connector	LK WASH	= lock washer	PIV	= peak inverse voltage	TA	= tantalum
CP	= cadmium plate	LOG	= logarithmic taper	P/O	= part of	TD	= time delay
CRT	= cathode-ray tube	LPF	= low pass filter	POLY	= polystyrene	TGL	= toggle
CW	= clockwise	M	= milli = 10^{-3}	PORC	= porcelain	TI	= titanium
DEPC	= deposited carbon	MEG	= meg = 10^6	POS	= position(s)	TOL	= tolerance
DR	= drive	MET FLM	= metal film	POT	= potentiometer	TRIM	= trimmer
ELECT	= electrolytic	MET OX	= metallic oxide	PP	= peak-to-peak	TWT	= traveling wave tube
ENCAP	= encapsulated	MFR	= manufacturer	PT	= point	U	= micro = 10^{-6}
EXT	= external	MINAT	= miniature	PWV	= peak working voltage	VAR	= variable
F	= farads	MOM	= momentary	RECT	= rectifier	VDCW	= dc working volts
FH	= flat head	MTG	= mounting	RF	= radio frequency	W/	= with
FIL H	= fillister head	MY	= "mylar"	RH	= round head	W	= watts
FXD	= fixed	N	= nano (10^{-9})	RIV	= reverse inverse voltage	WIV	= working inverse voltage
						WW	= wirewound
						W/O	= without

Table 6-1. Chassis Parts

Reference Designation	Stock No.	Description #	Note
A1	05100-6003	ASSY.- PUSHBUTTON SWITCH	
A2	05100-6005	SEARCH OSCILLATOR MODULE	
A3	05100-6006	3-4 MC SWITCH MODULE	
A4	05100-6004	CONNECTOR BLOCK MODULE	
A5	05100-6001	MIXER/DIVIDER MODULE 3.0-3.1 MC	
A6	05100-6001	MIXER/DIVIDER MODULE 3.0-3.1 MC	
A7	05100-6001	MIXER/DIVIDER MODULE 3.0-3.1 MC	
A8	05100-6001	MIXER/DIVIDER MODULE 3.0-3.1 MC	
A9	05100-6001	MIXER/DIVIDER MODULE 3.0-3.1 MC	
A10	05100-6001	MIXER/DIVIDER MODULE 3.0-3.1 MC	
A11	05100-6001	MIXER/DIVIDER MODULE 3.0-3.1 MC	
A12	05100-6002	MIXER/FILTER MODULE 30-31 MC	
A13	05100-6016	39 TO 390 MC MULTIPLIER MODULE	
A14	05100-6017	38 TO 380 MC MULTIPLIER MODULE	
A15	05100-6018	37 TO 370 MC MULTIPLIER MODULE	
A16	05100-6019	36 TO 360 MC MULTIPLIER MODULE	
A17	05100-6020	35 TO 350 MC MULTIPLIER MODULE	
A18	05100-6021	33 TO 330 MC MULTIPLIER MODULE	
A19	05100-6010	30 TO 39 MC SWITCH MODULE	
A20	05100-6011	350 TO 390 MC SWITCH MODULE	
A21	05100-6012	1ST UHF MIXER MODULE	
A22	05100-6013	2ND UHF MIXER MODULE	
A23	05100-6014	3RD UHF MIXER MODULE	
A24	05100-6015	OUTPUT AMPLIFIER MODULE	
A25	05100-6007	POWER SUPPLY MODULE	
DS1	1450-0048	LAMP:NEON	
F1	2110-0012	FUSE,CARTRIDGE 1/2 AMP 250 V	
F2	2110-0004	FUSE,CARTRIDGE 1/8 AMP 250 V	
FL1	9110-0059	FILTER:BANDPASS 390 MC	
FL2	9110-0058	FILTER:BANDPASS 380 MC	
FL3	9110-0057	FILTER:BANDPASS 370 MC	
FL4	9110-0056	FILTER:BANDPASS 360 MC	
FL5	9110-0055	FILTER:BANDPASS 350 MC	
FL6	9110-0054	FILTER:BANDPASS 330 MC	
FL7	9110-0056	FILTER:BANDPASS 360 MC	
FL8	9110-0060	FILTER:BANDPASS 395 MC	
J1	1250-0123	CONNECTOR:BNC(SEARCH OSC)	
J2	1250-0140	PART OF W16	
J3	1250-0214	CONNECTOR:FRONT PANEL	
J4	1250-0140	PART OF W17,OUTPUT CABLE	
J5	1250-0140	PART OF W14,HI-LEVEL OUT CABLE	
J6	1250-0140	PART OF W15,LO-LEVEL OUT CABLE	
J7,8,9	1251-0087	PART OF W19,REMOTE CABLE ASSY	
J10		PART OF W3	
J11	1250-0140	PART OF W2,3 MC INPUT CABLE	
J12	9110-0086	FILTER:ELECTRICAL POWER LINE	
J13	1251-0384	CONNECTOR:SUBMINIATURE TYPE D (9 CONTACT)	
J14	1251-0384	CONNECTOR:SUBMINIATURE TYPE D (9 CONTACT)	
M1	1120-0152	MICROAMMETER:100 MICRO AMPERES	
R1	0687-3331	R:FXD COMP 33K OHM 10% 1/2W	
S1	3101-0038	SWITCH:TOGGLE DPDT 3 AMP 125V	

See list of abbreviations in introduction to this section

Table 6-1. Chassis Parts Cont'd.

Reference Designation	Stock No.	Description #	Note
S2	3101-0038	SWITCH:TOG DPDT 3 AMP 125 V	
S3	3100-0500	SWITCH:ROTARY	
	0370-0112	KNOB	
S4	3101-0038	SWITCH:TOG DPDT 3 AMP 125 V	
S5	3101-0033	SWITCH:SLIDE DPDT	
W1	8120-0078	CABLE POWER:7.5FT.	
W2	05100-6118	ASSY.- 3 MC INPUT CABLE INCLUDES J11	
W3	05100-6117	ASSY.- 24 MC INPUT CABLE INCLUDES J10	
W4	05100-6212	CABLE ASSY.- LO FREQ INTERCONNECT	
W4A	05100-6190	CABLE ASSY.- 3.0MC INTER-CONNECT	
W4B	05100-6191	CABLE ASSY.- 3.1MC INTER-CONNECT	
W4C	05100-6192	CABLE ASSY.- 3.2MC INTER-CONNECT	
W4D	05100-6193	CABLE ASSY.- 3.3MC INTER-CONNECT	
W4E	05100-6194	CABLE ASSY.- 3.4MC INTER-CONNECT	
W4F	05100-6195	CABLE ASSY.- 3.5MC INTER-CONNECT	
W4G	05100-6196	CABLE ASSY.- 3.6MC INTER-CONNECT	
W4H	05100-6197	CABLE ASSY.- 3.7MC INTER-CONNECT	
W4I	05100-6198	CABLE ASSY.- 3.8MC INTER-CONNECT	
W4J	05100-6199	CABLE ASSY.- 3.9MC INTER-CONNECT	
W4K	05100-6210	CABLE ASSY.- 24MC INTER-CONNECT	
W4L	05100-6211	CABLE ASSY.- INITIAL 3MC INTERCONNECT	
W5	05100-6213	CABLE ASSY.- HI FREQ. INTERCONNECT	
W5A	05100-6200	CABLE ASSY.- 30 MC INTER-CONNECT	
W5B	05100-6201	CABLE ASSY.- 31 MC INTER-CONNECT	
W5C	05100-6202	CABLE ASSY.- 32 MC INTER-CONNECT	
W5D	05100-6203	CABLE ASSY.- 33 MC INTER-CONNECT	
W5E	05100-6204	CABLE ASSY.- 34 MC INTER-CONNECT	
W5F	05100-6205	CABLE ASSY.- 35 MC INTER-CONNECT	
W5G	05100-6206	CABLE ASSY.- 36 MC INTER-CONNECT	
W5H	05100-6207	CABLE ASSY.- 37 MC INTER-CONNECT	
W5I	05100-6208	CABLE ASSY.- 38 MC INTER-CONNECT	
W5J	05100-6209	CABLE ASSY.- 39 MC INTER-CONNECT	
W6	05100-6177	CABLE- BUSS FREQUENCY	
W6A	05100-6104	CABLE- TRANSFER #1	
W6B	05100-6105	CABLE- TRANSFER #2	
W6C	05100-6106	CABLE- TRANSFER #3	
W6D	05100-6107	CABLE- TRANSFER #4	
W6E	05100-6108	CABLE- TRANSFER #5	
W6F	05100-6109	CABLE- TRANSFER #6	
W6G	05100-6110	CABLE:TRANSFER #7	
W6H	05100-6111	CABLE- TRANSFER #8	
W6I	05100-6175	CABLE- OSC PROGRAMMING	
W7	05100-6181	CABLE- MULTIPLIER INPUT	
W7A	05100-6119	CABLE- 33MC MULTIPLIER INPUT	
W7B	05100-6120	CABLE- 35MC MULTIPLIER INPUT	
W7C	05100-6121	CABLE- 36MC MULTIPLIER INPUT	
W7D	05100-6122	CABLE- 37MC MULTIPLIER INPUT	
W7E	05100-6123	CABLE- 38MC MULTIPLIER INPUT	

See list of abbreviations in introduction to this section

Table 6-1. Chassis Parts Cont'd.

Reference Designation	Stock No.	Description #	Note
W7 F	05100-6124	CABLE- 39MC MULTIPLIER INPUT	
W8	05100-6178	CABLE ASSY. MULTIPLIER OUTPUT	
W8 A	05100-6126	CABLE- 350 MC OUTPUT	
W8 B	05100-6127	CABLE- 360 MC OUTPUT	
W8 C	05100-6128	CABLE- 370 MC OUTPUT	
W8 D	05100-6129	CABLE- 380 MC OUTPUT	
W8 E	05100-6130	CABLE- 30 MC OUTPUT	
W8 F	05100-6159	CABLE- 390 MC OUTPUT	
W9	05100-6125	CABLE- 330 MC OUTPUT	
W10	05100-6133	CABLE-MIXER #1 OUTPUT	
W11	05100-6131	CABLE- MIXER # 2 OUTPUT	
W12	05100-6100	CABLE- MIXER #3 INPUT	
W13	05100-6132	CABLE-MIXER #3 OUTPUT	
W14	05100-6067	ASSY.- HI-LEVEL OUT CABLE INCLUDES J5	
W15	05100-6068	ASSY.- LO-LEVEL OUT CABLE INCLUDES J6	
W16	05100-6134	ASSY.- SEARCH OSC. OUT CABLE	
W17	05100-6065	CABLE ASSY.- OUTPUT INCLUDES J4	
W18	05100-6066	ASSY.- OUTPUT JUMPER CABLE	
W19	05100-6055	CABLE ASSY. REMOTE, INCLUDES J7, J8, J9	
XF1	1400-0084	FUSEHOLDER EXTRACTOR POST TYPE	
XF2	1400-0084	FUSEHOLDER EXTRACTOR POST TYPE	
		MISCELLANEOUS	
	05100-6176	ASSY.- WELDING, HI FREQ. DECK	
	05100-2048	BAR- MTG.	
	05100-2061	BUSHING- LATCH	
	05100-4010	CLAMP- FILTER, HI FREQ DECK	
	05100-6180	CABLE ASSY.- DECADE TEST	
	1251-0194	CONNECTOR:PRINTED CIRCUIT 15-CONTACT XA25A1	
	1251-0382	CONNECTOR:12-TERMINAL XA25A2	
	05100-6061	COVER ASSY.- BOTTOM	
	05100-6062	COVER ASSY.- TOP	
	0510-0097	FASTENER:PUSH-ON TYPE	
	0900-0034	GASKET:SILICONE RUBBER 1-7/16IDX1-5/8OD	
	05100-2063	LATCH- DECK	
	05100-6060	POWER SUPPLY CABLE ASSY.	
	05100-2025	PIN- PIVOT	
	0510-0212	FASTENER:HI-FREQ DECK	
	1460-0164	SPRING:HELICAL 0.25X0.30 0.022D WIRE	
	1490-0030	STAND:TILT	
	05100-6063	STRAP- GROUND	
	05100-2049	SUPPORT- SWITCH	
	3100-0701	SWITCH:ROTARY, LOCK-OPERATE	
	0370-0112	KNOB	

See list of abbreviations in introduction to this section

Table 6-2. Pushbutton Switch Assembly A1 (05100-6003)
(Prefix all parts in this table A1)

Reference Designation	Stock No.	Description #	Note
C1	0150-0121 0510-0210	C1FXD CER 0.1UF 50 VDCW NUT:CAPTIVE 8-32X15/32X0.263D	
CR1	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
CR2	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
CR3	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
CR4	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
CR5	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
CR6	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
CR7	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
CR8	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
CR9	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
CR10	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
L2	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
L3	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
L4	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
L5	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
L6	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
L7	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
L8	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
L9	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
L10	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
L11	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
L12	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
L13	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
L14	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
R1	0683-2235	R1FXD COMP 22K OHM 5% 1/4W	
R2	0683-2235	R1FXD COMP 22K OHM 5% 1/4W	
R3	0683-2235	R1FXD COMP 22K OHM 5% 1/4W	
R4	0683-2235	R1FXD COMP 22K OHM 5% 1/4W	
R5	0683-2235	R1FXD COMP 22K OHM 5% 1/4W	
R6	0683-4725	R1FXD COMP 4700 OHM 5% 1/4W	
R7	0683-4725	R1FXD COMP 4700 OHM 5% 1/4W	
R8	0683-4725	R1FXD COMP 4700 OHM 5% 1/4W	
R9	0683-4725	R1FXD COMP 4700 OHM 5% 1/4W	
R10	0683-4725	R1FXD COMP 4700 OHM 5% 1/4W	
R11	0683-4725	R1FXD COMP 4700 OHM 5% 1/4W	
R12	0683-4725	R1FXD COMP 4700 OHM 5% 1/4W	
R13	0683-4725	R1FXD COMP 4700 OHM 5% 1/4W	
R14	0683-4725	R1FXD COMP 4700 OHM 5% 1/4W	
R15	0683-4725	R1FXD COMP 4700 OHM 5% 1/4W	
S1	3104-0005	SWITCH:PUSHBUTTON	
S2	3104-0006	SWITCH:PUSHBUTTON	
S3	3104-0007	SWITCH:PUSHBUTTON	
S4	3104-0007	SWITCH:PUSHBUTTON	
S5	3104-0007	SWITCH:PUSHBUTTON	
S6	3104-0007	SWITCH:PUSHBUTTON	
S7	3104-0007	SWITCH:PUSHBUTTON	
S8	3104-0007	SWITCH:PUSHBUTTON	

See list of abbreviations in introduction to this section

Table 6-2. Pushbutton Switch Assembly A1 (05100-6003) Cont'd.
(Prefix all parts in this table A1)

Reference Designation	Stock No.	Description #	Note
S9	3104-0007	SWITCH:PUSHBUTTON	
S10	3104-0007	SWITCH:PUSHBUTTON	
		MISCELLANEOUS	
	05100-0023	BAR-LOCKING	
	05100-2037	BAR-RETAINING	
	05100-2035	BAR-SWITCH	
	05100-0025	BRACKET-CABLE	
	05100-2065	BRACKET-SWITCH	
	05100-6051	CABLE ASSY.-3-4MC	
	05100-6052	CABLE ASSY.8MI-FREQ.	
	05100-6055	CABLE ASSY.-REMOTE	
	05100-0067	GUARD-SWITCH	
	05100-2036	ROD-SWITCH LOCKING	
	05100-2038	SPACER-SWITCH	

See list of abbreviations in introduction to this section

Table 6-3. Search Oscillator Module A2 (05100-6005)
(Prefix all parts in this table A2)

Reference Designation	Stock No.	Description #	Note
A1	05100-6028 05100-2006	OSCILLATOR-BOARD ASSY. BLANK BOARD-OSCILLATOR	
A1C1	0140-0202	C:FXD MICA 15 PF 5% 500VDCW	
A1C2	0140-0202	C:FXD MICA 15 PF 5% 500VDCW	
A1C3	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C4	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C5	0140-0151	C:FXD MICA 820PF 2% 300VDCW	
A1C6	0150-0111	C:FXD CER 220PF 5% 300VDCW	
	0380-0059	SPACER:SLEEVE BRS CP 0.250DX0.152IDX0.25	
A1C7	0140-0145	C:FXD MICA 22 PF 5% 500 VDCW	
A1C8	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C9	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C10	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1CR1	1902-0126	SEMICON DEVICE:DIODE 2.61V 5% BREAKDOWN	
A1CR2	1902-0126	SEMICON DEVICE:DIODE 2.61V 5% BREAKDOWN	
A1CR3	1902-0126	SEMICON DEVICE:DIODE 2.61V 5% BREAKDOWN	
A1CR4	1902-0126	SEMICON DEVICE:DIODE 2.61V 5% BREAKDOWN	
A1CR5	0122-0006	C:VAR VOLTAGE 100 PF AT -4V	
A1CR6	0122-0006	C:VAR VOLTAGE 100 PF AT -4V	
A1L1	05100-6171	ASSY.-OSC. COIL 26UH	
A1Q1	1850-0091	TRANSISTOR:GERMANIUM 2N2048 PNP	
A1Q2	1850-0119	TRANSISTOR-PNP GERMANIUM EIA 2N963	
A1R1	0727-0137	R:FXD DEPC 5.18K OHM 1% 1/2W	
A1R2	0727-0115	R:FXD DEPC 2000 OHM 1% 1/2W	
A1R3	0727-0109	R:FXD DEPC 1470 OHM 1% 1/2W	
A1R4	0757-0197	R:FXD MET FLM 1500 OHM 1% 1/2W	
A1R5	0757-0079	R:FXD MET FLM 2700 OHM 2% 1/2W	
A1R6	0683-2735	R:FXD COMP 27K OHM 5% 1/4W	
A1R7	0757-0079	R:FXD MET FLM 2700 OHM 2% 1/2W	
A1R8	0758-0009	R:FXD MET FLM 6800 OHM 5% 1/2W	
A1R9	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	
A1R10	0758-0006	R:FXD MET FLM 10K OHM 5% 1/2W	
A1R11	0758-0010	R:FXD MET 0X FLM 3300 OHM 5% 1/2W	
A1R12	0683-1235	R:FXD COMP 12K OHM 5% 1/4W	
A1R13	0683-1235	R:FXD COMP 12K OHM 5% 1/4W	
A1R14	0683-4715	R:FXD COMP 470 OHM 5% 1/4W	
A1R15	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	
A1R16	2100-0737	R:VAR WW 200 OHM TYPE H CONFIGURATION	
A2	05100-6029 05100-2007	OUTPUT BOARD ASSY. BLANK BOARD-OUTPUT	
A2C1	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C2	0160-0193	C:FXD MICA 1125PF 5%	
A2C2	0380-0059	SPACER:SLEEVE BRS CP 0.250DX0.152IDX0.25	
A2C3	0140-0151	C:FXD MICA 820PF 2% 300VDCW	
A2C4	0140-0152	C:FXD MICA 1000 PF 5% 300 VDCW	
A2C5	0160-0192	C:FXD MICA 525 PF 5%	

See list of abbreviations in introduction to this section

Table 6-3. Search Oscillator Module A2 (05100-6005) Cont'd.
(Prefix all parts in this table A2)

Reference Designation	Stock No.	Description #	Note
A2CR1	1901-0025	SEMICON DEVICE:DIODE JUNCTION	
A2L1	9140-0141	COIL:FXD RF 0.68 UH	
A2L2	9140-0180	COIL:FXD 2.7UH 10%	
A2L3	9140-0179	COIL:FXD R.F. 22 UH 10% 275 MA	
A2L4	9140-0096	COIL:FXD RF 1 UH	
A2R1	0758-0012	R:FXD MET FLM 12K OHM 5% 1/2W	
A2R2	0758-0043	R:FXD MET FLM 1800 OHM 5% 1/2W	
A2R3	0757-0914	R:FXD MET FLM 390 OHM 2% 1/8W	
A2R4	2100-0277	R:VAR COMP 100 OHM 20% LIN 0.3W	
A2R5	0758-0024	R:FXD MET FLM 100 OHM 5% 1/2W	
C1	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C2	0150-0121	C:FXD CER 0.1UF 50 VDCW	
C3	0150-0121	C:FXD CER 0.1UF 50 VDCW	
C4	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
J1	1250-0083	CONNECTOR:BNC	
L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
L2	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
R1	2100-0024	R:VAR COMP 1000 OHM 10% LIN 2W	
		MISCELLANEOUS	
	05100-0026	BRACKET-SEARCH OSC.	
	05100-0027	COVER-SEARCH OSC.	
	05100-0070	PLATE-SEARCH OSC.	
	05100-2040	PLATE-SIDE	
	0340-0039	INSULATOR:BUSHING	
	0370-0030	KNOB:	
	5020-0241	SUPPORT:ETCHED CIRCUIT BOARD	
	0340-0037	TERMINAL:STUD	
	0340-0038	TERMINAL:STUD	

See list of abbreviations in introduction to this section

Table 6-4. 3 to 4 Mc Switch Module A3 (05100-6006)
(Prefix all parts in this table A3)

Reference Designation	Stock No.	Description #	Note
A1	05100-6030	ASSY.- 3-4 MC SWITCH BD.	
A1C1	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C2	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C3	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C4	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C5	0150-0121	C:FXD CER 0.1UF 50 VDCW	
A1C6	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C7	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C8	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C9	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C10	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C11	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C12	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C13	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C14	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C15	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C16	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C17	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C18	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1CR1	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR2	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR3	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR4	1901-0025	SEMICON DEVICE:DIODE JUNCTION	
A1CR5	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR6	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR7	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR8	1901-0025	SEMICON DEVICE:DIODE JUNCTION	
A1CR9	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR10	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR11	1901-0025	SEMICON DEVICE:DIODE JUNCTION	
A1CR12	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR13	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR14	1901-0025	SEMICON DEVICE:DIODE JUNCTION	
A1CR15	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR16	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR17	1901-0025	SEMICON DEVICE:DIODE JUNCTION	
A1CR18	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR19	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR20	1901-0025	SEMICON DEVICE:DIODE JUNCTION	
A1CR21	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR22	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR23	1901-0025	SEMICON DEVICE:DIODE JUNCTION	
A1CR24	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR25	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR26	1901-0025	SEMICON DEVICE:DIODE JUNCTION	
A1Q1	1850-0091	TRANSISTOR:GERMANIUM 2N2048 PNP	
A1R1	0683-1035	R:FXD COMP 10K OHM 5% 1/4 W	
A1R2	0683-3625	R:FXD COMP 3600 OHM 5% 1/4W	

See list of abbreviations in introduction to this section

Table 6-4. 3 to 4 Mc Switch Module A3 (05100-6006) Cont'd.
(Prefix all parts in this table A3)

Reference Designation	Stock No.	Description #	Note
A1R3	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R4	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R5	0683-1035	RIFXD COMP 10K OHM 5% 1/4 W	
A1R6	0683-3625	RIFXD COMP 3600 OHM 5% 1/4W	
A1R7	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R8	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R9	0683-3315	RIFXD COMP 330 OHM 5% 1/4W	
A1R10	0683-2225	RIFXD COMP 2.2K OHM 5% 1/4W	
A1R11	0683-2225	RIFXD COMP 2.2K OHM 5% 1/4W	
A1R12	0683-1035	RIFXD COMP 10K OHM 5% 1/4 W	
A1R13	0683-1525	RIFXD COMP 150 OHM 5% 1/4W	
A1R14	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R15	0683-1035	RIFXD COMP 10K OHM 5% 1/4 W	
A1R16	0683-1525	RIFXD COMP 150 OHM 5% 1/4W	
A1R17	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R18	0683-1035	RIFXD COMP 10K OHM 5% 1/4 W	
A1R19	0683-1525	RIFXD COMP 150 OHM 5% 1/4W	
A1R20	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R21	0683-1035	RIFXD COMP 10K OHM 5% 1/4 W	
A1R22	0683-1525	RIFXD COMP 150 OHM 5% 1/4W	
A1R23	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R24	0683-1035	RIFXD COMP 10K OHM 5% 1/4 W	
A1R25	0683-1525	RIFXD COMP 150 OHM 5% 1/4W	
A1R26	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R27	0683-1035	RIFXD COMP 10K OHM 5% 1/4 W	
A1R28	0683-1525	RIFXD COMP 150 OHM 5% 1/4W	
A1R29	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A2		SAME AS A1, PREFIX A2	
A3		SAME AS A1, PREFIX A3	
A4		SAME AS A1, PREFIX A4	
A5		SAME AS A1, PREFIX A5	
A6		SAME AS A1, PREFIX A6	
A7		SAME AS A1, PREFIX A7	
A8		SAME AS A1, PREFIX A8	
A9		SAME AS A1, PREFIX A9	
A10		SAME AS A1, PREFIX A10	
A11		SAME AS A1, PREFIX A11	
J1	THRU		
J8		CONNECTOR:JACK CHASSIS BNC	
J9		CONNECTOR:BNC JACK	
J10		CONNECTOR:JACK CHASSIS BNC	
J11		CONNECTOR:JACK CHASSIS BNC	

See list of abbreviations in introduction to this section

Table 6-4. 3 to 4 Mc Switch Module A3 (05100-6006) Cont'd.
(Prefix all parts in this table A3)

Reference Designation	Stock No.	Description #	Note
J12	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J13	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J14	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J15	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J16	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J17	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J18	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J19	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J20	1251-0087	PART OF #1 3-4 MC CABLE(05100-6053)	
J21	1251-0087	PART OF #2 3-4 MC CABLE(05100-6054)	
R1	0758-0093	R:FXD MET OX 56 OHM 5% 1/2W	
R2	0758-0093	R:FXD MET OX 56 OHM 5% 1/2W	
R3	0758-0093	R:FXD MET OX 56 OHM 5% 1/2W	
R4	0758-0093	R:FXD MET OX 56 OHM 5% 1/2W	
R5	0758-0093	R:FXD MET OX 56 OHM 5% 1/2W	
R6	0758-0093	R:FXD MET OX 56 OHM 5% 1/2W	
R7	0758-0093	R:FXD MET OX 56 OHM 5% 1/2W	
R8	0758-0093	R:FXD MET OX 56 OHM 5% 1/2W	
R9	0758-0093	R:FXD MET OX 56 OHM 5% 1/2W	
R10	0758-0093	R:FXD MET OX 56 OHM 5% 1/2W	
R11	0758-0093	R:FXD MET OX 56 OHM 5% 1/2W	
R12	0758-0036	R:FXD MET FLM 3600 OHM 5% 1/2W	
R13	0758-0036	R:FXD MET FLM 3600 OHM 5% 1/2W	
R14	0758-0017	R:FXD MET FLM 1500 OHM 5% 1/2W	
R15	0758-0017	R:FXD MET FLM 1500 OHM 5% 1/2W	
R16	0758-0017	R:FXD MET FLM 1500 OHM 5% 1/2W	
R17	0758-0017	R:FXD MET FLM 1500 OHM 5% 1/2W	
R18	0758-0017	R:FXD MET FLM 1500 OHM 5% 1/2W	
R19	0758-0017	R:FXD MET FLM 1500 OHM 5% 1/2W	
		MISCELLANEOUS	
	05100-6053	ASSY.-CABLE 3-4 #1 INCLUDES J20	
	05100-6054	ASSY.-CABLE 3-4 #2 INCLUDES J21	
	05100-2008	BLANK BOARD	
	05100-2044	COVER:BOTTOM	
	05100-2043	COVER:TOP	
	05100-0058	GASKET TOP	
	05100-0059	GASKET BOTTOM	
	05100-2030	HOUSING:3-4 MC SWITCH	

See list of abbreviations in introduction to this section

Table 6-5. Connector Block Module A4 (05100-6004)
(Prefix all parts in this table A4)

Reference Designation	Stock No.	Description #	Note
A1	05100-6026	BOARD ASSEMBLY-METER AMPLIFIER	
	05100-2004	BLANK BOARD:METER AMP.	
A1C1	0160-2055	C1FXD CER 0.01UF +80-20% 100VDCW	
A1C2	0160-2055	C1FXD CER 0.01UF +80-20% 100VDCW	
A1C3	0160-2055	C1FXD CER 0.01UF +80-20% 100VDCW	
A1C4	0160-2055	C1FXD CER 0.01UF +80-20% 100VDCW	
A1C5	0160-2055	C1FXD CER 0.01UF +80-20% 100VDCW	
A1C6	0160-2055	C1FXD CER 0.01UF +80-20% 100VDCW	
A1C7	0160-2055	C1FXD CER 0.01UF +80-20% 100VDCW	
A1C8	0160-2055	C1FXD CER 0.01UF +80-20% 100VDCW	
A1CR1	1901-0025	SEMICON DEVICE:DIODE JUNCTION	
A1L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L2	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1Q1	1850-0091	TRANSISTOR:GERMANIUM 2N2048 PNP	
A1Q2	1850-0062	TRANSISTOR:GERMANIUM SPL 2N404	
A1R1	0757-0368	R1FXD MET FLM 34.0 OHM 1% 1/8W	
A1R2	0757-0368	R1FXD MET FLM 34.0 OHM 1% 1/8W	
A1R3	0683-4715	R1FXD COMP 470 OHM 5% 1/4W	
A1R4	0683-1225	R1FXD COMP 1200 OHM 5% 1/4W	
A1R5	0683-1005	R1FXD COMP 10 OHM 5% 1/4W	
A1R6	0683-3025	R1FXD COMP 3000 OHM 5% 1/4W	
A1R7	0757-0270	R1FXD MET FLM 249K OHM 1% 1/8W	
A1R8	0758-0031	R1FXD MET FLM 680 OHM 5% 1/2W	
A1R9	0757-0271	R1FXD MET FLM 124K OHM 1% 1/8W	
A1R10	0683-5625	R1FXD COMP 560 OHM 5% 1/4W	
A1R11	0758-0006	R1FXD MET FLM 10K OHM 5% 1/2W	
A1R12	0721-0004	R1FXD DEPC 100K OHM 1% 1/8W	
A2	05100-6027	BOARD ASSEMBLY-24MC AMPLIFIER	
	05100-2005	BLANK BOARD: 24 MC AMP.	
	9170-0105	CORE:ADJUSTABLE TUNING	
A2C1	0160-2055	C1FXD CER 0.01UF +80-20% 100VDCW	
A2C2	0160-2055	C1FXD CER 0.01UF +80-20% 100VDCW	
A2C3	0160-2055	C1FXD CER 0.01UF +80-20% 100VDCW	
A2C4	0160-2055	C1FXD CER 0.01UF +80-20% 100VDCW	
A2C5	0160-0357	C1FXD CER 85PF 5% 500VDCW	
A2C6	0160-2055	C1FXD CER 0.01UF +80-20% 100VDCW	
A2C7	0160-2055	C1FXD CER 0.01UF +80-20% 100VDCW	
A2C8	0160-2055	C1FXD CER 0.01UF +80-20% 100VDCW	
A2C9	0160-2055	C1FXD CER 0.01UF +80-20% 100VDCW	
A2C10	0160-2055	C1FXD CER 0.01UF +80-20% 100VDCW	
A2L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L2	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L3	05100-6174	COIL ASSY.-VARIABLE .27-.35UH	
A2L4	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L5	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2Q1	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q2	1850-0119	TRANSISTOR-PNP GERMANIUM EIA 2N963	
A2R1	0757-0277	R1FXD MET FLM 49.9 OHM 1% 1/8W	

See list of abbreviations in introduction to this section

Table 6-5. Connector Block Module A4 (05100-6004) Cont'd.
(Prefix all parts in this table A4)

Reference Designation	Stock No.	Description #	Note
A2R2	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	
A2R3	0757-0275	R:FXD MET FLM 113 OHM 1% 1/8W	
A2R4	0683-6825	R:FXD COMP 6800 OHM 5% 1/4W	
A2R5	0757-0269	R:FXD MET FLM 270 OHM 1% 1/8W	
A2R6	0757-0273	R:FXD MET FLM 3.01K OHM 1% 1/8W	
A2R7	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	
A2R8	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	
A3	05100-6025 05100-2003	BOARD ASSEMBLY-EMITTER FOLLOWER BLANK BOARD	
A3C1	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A3C2	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A3C3	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A3L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A3Q1	1850-0119	TRANSISTOR-PNP GERMANIUM EIA 2N963	
A3R1	0683-4715	R:FXD COMP 470 OHM 5% 1/4W	
A3R2	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	
A3R3	0683-7515	R:FXD COMP 750 OHM 5% 1/4W	
A4	05100-6025	BOARD ASSEMBLY-EMITTER FOLLOWER SAME AS A3;PREFIX A4	
L1	9140-0115	COIL:FXD RF 22UH 10%	
L2	9140-0115	COIL:FXD RF 22UH 10%	
L3	9140-0115	COIL:FXD RF 22UH 10%	
L4	9140-0115	COIL:FXD RF 22UH 10%	
L5	9140-0115	COIL:FXD RF 22UH 10%	
L6	9140-0115	COIL:FXD RF 22UH 10%	
L7	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
L8	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
		MISCELLANEOUS	
	05100-2029	BLOCK:DECADE CONNECTOR	
	05100-6004	BLOCK ASSY.-DECADE CONNECTOR	
	05100-6103	CABLE ASSY.-30 MC OUTPUT	
	05100-6112	CABLE ASSY.- +6.3V CONNECT	
	05100-6113	CABLE ASSY.- INTERCONNECT	
	05100-6114	CABLE ASSY.- 12.6V CONNECT	
	05100-6115	CABLE ASSY.-24MC CONNECT	
	05100-6116	CABLE ASSY.-24 MC BUSS	
	05100-6184	CABLE ASSY.-3MC	
	1250-0149	CONNECTOR:RF COAXIAL BNC RT-ANGLE RECEPT	
	1251-0424	CONNECTOR:MALE SINGLE BANANA	
	05100-0001	COVER:METER AMPLIFIER	
	05100-0007	COVER:CONNECTOR BLOCK	
	0510-0213	NUT:CAPTIVE SST 4-40	
	0360-0357	TERMINAL:FEED-THRU	
	0360-0358	TERMINAL:PRESS-IN	

See list of abbreviations in introduction to this section

Table 6-6. Mixer/Divider Modules A5-A11 (05100-6001)
(Prefix all parts in this table A5-A11)

Reference Designation	Stock No.	Description #	Note
A1	05100 6023 05100-2001 05100-2039	BOARD ASSY.-DECADE MIXER BLANK-BOARD STRIP-GROUND	
A1C1	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C2	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C3	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C4	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C5	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C6	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C7	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C8	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C9	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C10	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C11	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C12	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C13 THRU A1C15		NOT ASSIGNED	
A1C16	0160-0326	C:FXD CER 2.2PF+/-0.1PF	
A1C17	0160-0326	C:FXD CER 2.2PF+/-0.1PF	
A1C18	0160-0344	C:FXD MICA 220PF 1%	
A1C19	0160-0341	C:FXD MICA 640PF 1%	
A1C20	0160-0327	C:FXD CER 3.4PF+/-0.1PF	
A1C21	0140-0222	C:FXD MICA 240PF 1% 300VDCW	
A1C22	0140-0233	C:FXD MICA 480PF 1% 300VDCW	
A1C23	0140-0226	C:FXD MICA 320PF 1% 300VDCW	
A1C24	0140-0226	C:FXD MICA 320PF 1% 300VDCW	
A1C25	0160-0328	C:FXD CER 4.6PF+/-0.1PF	
A1C26	0160-0337	C:FXD MICA 160PF 1%	
A1C27	0160-0327	C:FXD CER 3.4PF+/-0.1PF	
A1C28	0160-0344	C:FXD MICA 220PF 1%	
A1C29	0160-0341	C:FXD MICA 640PF 1%	
A1C30	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C31		NOT ASSIGNED	
A1C32	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C33	0160-0141	C:FXD CER 1500 PF 10% 500VDCW	
A1C34	0160-0340	C:FXD MICA 600PF 1%	
A1C35	0140-0225	C:FXD MICA 300PF 1% 300VDCW	
A1C36	0160-0326	C:FXD CER 2.2PF+/-0.1PF	
A1C37	0160-0326	C:FXD CER 2.2PF+/-0.1PF	
A1C38	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C39	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C40	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C41	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C42	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C43	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C44	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C45	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C46	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C47	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C48	0160-0339	C:FXD MICA 534PF 1%	

= See list of abbreviations in introduction to this section

Table 6-6. Mixer/Divider Modules A5-A11 (05100-6001) Cont'd.
(Prefix all parts in this table A5-A11)

Reference Designation	Stock No.	Description #	Note
A1C49	0160-0338	C:FXD MICA 267PF 1%	
A1CR1	1910-0029	SEMICON DEVICE:DIODES GERM. MATCHED PAIR	
A1CR2	1910-0029	SEMICON DEVICE:DIODES GERM. MATCHED PAIR	
A1CR3	1910-0029	SEMICON DEVICE:DIODES GERM. MATCHED PAIR	
A1CR4	1910-0029	SEMICON DEVICE:DIODES GERM. MATCHED PAIR	
A1L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L2	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L3	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L4	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L5	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L6 THRU		NOT ASSIGNED	
A1L10			
A1L11	9140-0114	COIL:FXD RF 10 UH	
A1L12	05100-6166	COIL-VARIABLE .16-.23UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L13	05100-6166	COIL-VARIABLE .16-.23UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L14	9140-0114	COIL:FXD RF 10 UH	
A1L15	05100-6166	COIL-VARIABLE .16-.23UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L16	05100-6166	COIL-VARIABLE .16-.23UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L17	05100-6166	COIL-VARIABLE .16-.23UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L18	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L19	9140-0114	COIL:FXD RF 10 UH	
A1L20	9140-0176	COIL-FXD R.F. 4 UH 5% 250 MA	
A1L21	9140-0177	COIL-FXD R.F. 8 UH 5% 500 MA	
A1L22	9140-0096	COIL:FXD RF 1 UH	
A1L23 THRU		NOT ASSIGNED	
A1L30			
A1L31	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L32	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L33	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L34	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L35	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L36	9140-0178	COIL-FXD R.F. 12 UH 10% 375 MA	
A1L37	9140-0178	COIL-FXD R.F. 12 UH 10% 375 MA	
A1Q1	1850-0119	TRANSISTOR-PNP GERMANIUM EIA 2N963	
A1Q2	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A1Q3	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A1Q4	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A1Q5	1850-0075	TRANSISTOR:GERMANIUM 2N779A PNP	
A1Q6	1850-0091	TRANSISTOR:GERMANIUM 2N2048 PNP	
A1R1	0683-4715	R:FXD COMP 470 OHM 5% 1/4W	
A1R2	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	
A1R3	0683-7515	R:FXD COMP 750 OHM 5% 1/4W	
A1R4	0757-0283	R:FXD MET FLM 2000 OHM 1% 1/8W	
A1R5	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	

See list of abbreviations in introduction to this section

Table 6-6. Mixer/Divider Modules A5-A11 (05100-6001) Cont'd.
(Prefix all parts in this table A5-A11)

Reference Designation	Stock No.	Description #	Note
A1R6	0757-0282	R:FXD MET FLM 221 OHM 1% 1/8W	
A1R7	0683-2025	R:FXD COMP 2000 OHM 5% 1/4W	
A1R8	0683-3025	R:FXD COMP 3000 OHM 5% 1/4W	
A1R9	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	
A1R10	0683-3025	R:FXD COMP 3000 OHM 5% 1/4W	
A1R11	0683-3025	R:FXD COMP 3000 OHM 5% 1/4W	
A1R12	0683-2225	R:FXD COMP 2.2K OHM 5% 1/4W	
A1R13	0683-3025	R:FXD COMP 3000 OHM 5% 1/4W	
A1R14	0683-5625	R:FXD COMP 5600 OHM 5% 1/4W	
A1R15	0683-1525	R:FXD COMP 1500 OHM 5% 1/4W	
A1R16	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	
A1R17	0683-3015	R:FXD COMP 300 OHM 5% 1/4W	
A1R18	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	
A1R19	0683-3925	R:FXD COMP 3900 OHM 5% 1/4W	
A1R20	0683-3905	R:FXD COMP 39 OHM 5% 1/4W	
A1R21	0757-0284	R:FXD MET FLM 150 OHM 1% 1/8W	
A1R22	0757-0284	R:FXD MET FLM 150 OHM 1% 1/8W	
A1R23	0757-0284	R:FXD MET FLM 150 OHM 1% 1/8W	
A1T1	05100-6172	TRANSFORMER-1.7UH	
A1T2	05100-6172	TRANSFORMER-1.7UH	
A2	05100-6024	BOARD ASSY.-DECADE DIVIDER	
	05100-2002	BLANK-BOARD	
	05100-2039	STRIP-GROUND	
A2C51	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C52	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C53	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C54	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C55	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C56	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C57	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C58	0150-0121	C:FXD CER 0.1UF 50 VDCW	
A2C59	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C60		NOT ASSIGNED	
A2C61	0160-0337	C:FXD MICA 160PF 1%	
A2C62	0160-0342	C:FXD MICA 800PF 1%	
A2C63	0160-0330	C:FXD CER 6.6PF +/-0.1PF	
A2C64	0140-0220	C:FXD MICA 200PF 1% 300VDC*	
A2C65	0140-0177	C:FXD MICA 400 PF 1% 300 VDCW	
A2C66	0160-0338	C:FXD MICA 267PF 1%	
A2C67	0160-0338	C:FXD MICA 267PF 1%	
A2C68	0160-0329	C:FXD CER 6.0PF +/-0.1PF	
A2C69	0160-0332	C:FXD MICA 133PF 1%	
A2C70	0160-0328	C:FXD CER 4.6PF +/-0.1PF	
A2C71	0160-0332	C:FXD MICA 133PF 1%	
A2C72	0160-0330	C:FXD CER 6.6PF +/-0.1PF	
A2C73	0140-0220	C:FXD MICA 200PF 1% 300VDC*	
A2C74	0140-0177	C:FXD MICA 400 PF 1% 300 VDCW	
A2C75		NOT ASSIGNED	
A2C76	0160-0333	C:FXD MICA 15PF +/-0.5PF	

= See list of abbreviations in introduction to this section

Table 6-6. Mixer/Divider Modules A5-A11 (05100-6001) Cont'd.
(Prefix all parts in this table A5-A11)

Reference Designation	Stock No.	Description #	Note
A2C77	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C78	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C79	0140-0230	C:FXD MICA 420PF 1% 300VDCW	
A2C80	0160-0344	C:FXD MICA 220 PF 1%	
A2C81	0160-0334	C:FXD MICA 47PF 0.5%	
A2C82	0160-0335	C:FXD MICA 91PF 1%	
A2C83	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C84	0160-0338	C:FXD MICA 267PF 1%	
A2C85	0160-0339	C:FXD MICA 534PF 1%	
A2C86	0160-0339	C:FXD MICA 534PF 1%	
A2C87 THRU		NOT ASSIGNED	
A2C90		C:FXD CER 0.01UF +80-20% 100VDCW	
A2C91	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C92	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C93	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C94	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C95	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C96	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C97	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2CR51	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A2CR52	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A2CR53	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A2CR54-CR56	1901-0040	DIODE,SILICON 30 MA 1V 30 PIV	
A2L51	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L52	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L53	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L54	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L55 THRU		NOT ASSIGNED	
A2L61	05100-6166	COIL-VARIABLE .16-.23UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A2L62	05100-6166	COIL-VARIABLE .16-.23UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A2L63	9140-0114	COIL:FXD RF 10 UH	
A2L64	05100-6166	COIL-VARIABLE .16-.23UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A2L65	05100-6166	COIL-VARIABLE .16-.23UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A2L66	05100-6166	COIL-VARIABLE .16-.23UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A2L67	05100-6166	COIL-VARIABLE .16-.23UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A2L68	05100-6170	COIL-VARIABLE 3.5-5.5UH	
A2L69	05100-6214	COIL:FXD RF 4.7 UH	
A2L70	05100-6168	COIL-VARIABLE 50-90UH	
A2L71	9140-0178	COIL-FXD R.F. 12 UH 10% 375 MA	
A2L72	9140-0178	COIL-FXD R.F. 12 UH 10% 375 MA	
A2L73 THRU		NOT ASSIGNED	
A2L80		COIL-FXD R.F. 22 UH 10% 275 MA	
A2L81	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L82	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	

See list of abbreviations in introduction to this section

Table 6-6. Mixer/Divider Modules A5-A11 (05100-6001) Cont'd.
(Prefix all parts in this table A5-A11)

Reference Designation	Stock No.	Description #	Note
A2L83	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L84	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2Q51	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q52	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q53	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q54	1850-0138	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q55	1850-0091	TRANSISTOR:GERMANIUM 2N2048 PNP	
A2R51	0757-0281	RIFXD MET FLM 2.74 K OHM 1% 1/8W	
A2R52	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R53	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R54	0683-3025	RIFXD COMP 3000 OHM 5% 1/4W	
A2R55	0757-0280	RIFXD MET FLM 1000 OHM 1% 1/8W	
A2R56	0683-3025	RIFXD COMP 3000 OHM 5% 1/4W	
A2R57	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R58	0683-3025	RIFXD COMP 3000 OHM 5% 1/4W	
A2R59	0683-2715	RIFXD COMP 270 OHM 5% 1/4W	
A2R60	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R61	0683-3025	RIFXD COMP 3000 OHM 5% 1/4W	
A2R62	0683-2215	RIFXD COMP 220 OHM 5% 1/4W	
A2R63	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R64	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R65	0683-1015	RIFXD COMP 100 OHM 5% 1/4W	
A2R66	0683-1225	RIFXD COMP 1200 OHM 5% 1/4W	
A2R67	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R68	0683-2025	RIFXD COMP 2000 OHM 5% 1/4W	
A2R69	0757-0398	RIFXD MET FLM 75 OHM 1% 1/8W	
A2R70	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A2T51	05100-6169	TRANSFORMER-FIXED	
A2T52	05100-6167	TRANSFORMER-VARIABLE	
	9170-0106	CORE:ADJUSTABLE TUNING MISCELLANEOUS	
	05100-6072	ASSY.-CABLE 3 MC OUT	
	05100-6073	ASSY.-CABLE 12.6V	
	05100-6074	ASSY.-CABLE 6.3V	
	05100-6076	ASSY.-CABLE 3 MC	
	05100-6077	ASSY.-CABLE 24 MC	
	05100-6070	ASSY.-CABLE 30 MC CONNECT	
	05100-6071	ASSY.-CABLE BUSS FREQ.	
	05100-6078	ASSY.-CLAMP	
	05100-2033	BAR-FRONT DECADE	
	05100-2034	BAR-REAR DECADE	
	05100-0010	BRACKET-DECADE	
	05100-0018	BRACKET-END	
	05100-0073	COVER-DECADE	
	05100-2032	CONNECTOR-DECADE	
	05100-6001	DIVIDER ASSY.-3.0-3.1MC MIXER	
	0510-0124	NUT:CAPTIVE 6-32 ST CP	

See list of abbreviations in introduction to this section

Table 6-7. Mixer/Filter Module A12 (05100-6002)
(Prefix all parts in this table A12)

Reference Designation	Stock No.	Description #	Note
A1	05100-6023 05100-2001 05100-2039	BOARD ASSY.-DECADE MIXER BLANK-BOARD STRIP-GROUND	
A1C1	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C2	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C3	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C4	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C5	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C6	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C7	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C8	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C9	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C10	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C11	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C12	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C13 THRU A1C15		NOT ASSIGNED	
A1C16	0160-0326	C:FXD CER 2.2PF+/-0.1PF	
A1C17	0160-0326	C:FXD CER 2.2PF+/-0.1PF	
A1C18	0160-0344	C:FXD MICA 220PF 1%	
A1C19	0160-0341	C:FXD MICA 640PF 1%	
A1C20	0160-0327	C:FXD CER 3.4PF+/-0.1PF	
A1C21	0140-0222	C:FXD MICA 240PF 1% 300VDCW	
A1C22	0140-0233	C:FXD MICA 480PF 1% 300VDCW	
A1C23	0140-0226	C:FXD MICA 320PF 1% 300VDCW	
A1C24	0140-0226	C:FXD MICA 320PF 1% 300VDCW	
A1C25	0160-0328	C:FXD CER 4.6PF+/-0.1PF	
A1C26	0160-0337	C:FXD MICA 160PF 1%	
A1C27	0160-0327	C:FXD CER 3.4PF+/-0.1PF	
A1C28	0160-0344	C:FXD MICA 220PF 1%	
A1C29	0160-0341	C:FXD MICA 640PF 1%	
A1C30	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C31		NOT ASSIGNED	
A1C32	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C33	0160-0141	C:FXD CER 1500 PF 10% 500VDCW	
A1C34	0160-0340	C:FXD MICA 600PF 1%	
A1C35	0140-0225	C:FXD MICA 300PF 1% 300VDCW	
A1C36	0160-0326	C:FXD CER 2.2PF+/-0.1PF	
A1C37	0160-0326	C:FXD CER 2.2PF+/-0.1PF	
A1C38	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C39	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C40	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C41	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C42	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C43	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C44	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C45	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C46	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C47	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C48	0160-0339	C:FXD MICA 534PF 1%	

See list of abbreviations in introduction to this section

Table 6-7. Mixer/Filter Module A12 (05100-6002) Cont'd.
(Prefix all parts in this table A12)

Reference Designation	Stock No.	Description #	Note
A1C49	0160-0338	C:FXD MICA 267PF 1%	
A1CR1	1910-0029	SEMICON DEVICE DIODES GERM. MATCHED PAIR	
A1CR2	1910-0029	SEMICON DEVICE DIODES GERM. MATCHED PAIR	
A1CR3	1910-0029	SEMICON DEVICE DIODES GERM. MATCHED PAIR	
A1CR4	1910-0029	SEMICON DEVICE DIODES GERM. MATCHED PAIR	
A1L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L2	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L3	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L4	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L5	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L6 THRU			
A1L10		NOT ASSIGNED	
A1L11	9140-0114	COIL:FXD RF 10 UH	
A1L12	05100-6166	COIL-VARIABLE .16-.23UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L13	05100-6166	COIL-VARIABLE .16-.23UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L14	9140-0114	COIL:FXD RF 10 UH	
A1L15	05100-6166	COIL-VARIABLE .16-.23UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L16	05100-6166	COIL-VARIABLE .16-.23UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L17	05100-6166	COIL-VARIABLE .16-.23UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L18	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L19	9140-0114	COIL:FXD RF 10 UH	
A1L20	9140-0176	COIL-FXD R.F. 4 UH 5% 250 MA	
A1L21	9140-0177	COIL-FXD R.F. 8 UH 5% 500 MA	
A1L22	9140-0096	COIL:FXD RF 1 UH	
A1L23 THRU			
A1L30		NOT ASSIGNED	
A1L31	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L32	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L33	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L34	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L35	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L36	9140-0178	COIL-FXD R.F. 12 UH 10% 375 MA	
A1L37	9140-0178	COIL-FXD R.F. 12 UH 10% 375 MA	
A1Q1	1850-0119	TRANSISTOR-PNP GERMANIUM EIA 2N963	
A1Q2	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A1Q3	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A1Q4	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A1Q5	1850-0075	TRANSISTOR:GERMANIUM 2N779A PNP	
A1Q6	1850-0091	TRANSISTOR:GERMANIUM 2N2048 PNP	
A1R1	0683-4715	R:FXD COMP 470 OHM 5% 1/4W	
A1R2	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	
A1R3	0683-7515	R:FXD COMP 750 OHM 5% 1/4W	
A1R4	0757-0283	R:FXD MET FLM 2000 OHM 1% 1/8W	
A1R5	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	

See list of abbreviations in introduction to this section

Table 6-7. Mixer/Filter Module A12 (05100-6002) Cont'd.
(Prefix all parts in this table A12)

Reference Designation	Stock No.	Description #	Note
A1R6	0757-0282	R:FXD MET FLM 221 OHM 1% 1/8W	
A1R7	0683-2025	R:FXD COMP 2000 OHM 5% 1/4W	
A1R8	0683-3025	R:FXD COMP 3000 OHM 5% 1/4W	
A1R9	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	
A1R10	0683-3025	R:FXD COMP 3000 OHM 5% 1/4W	
A1R11	0683-3025	R:FXD COMP 3000 OHM 5% 1/4W	
A1R12	0683-2225	R:FXD COMP 2.2K OHM 5% 1/4W	
A1R13	0683-3025	R:FXD COMP 3000 OHM 5% 1/4W	
A1R14	0683-5625	R:FXD COMP 560 OHM 5% 1/4W	
A1R15	0683-1525	R:FXD COMP 1500 OHM 5% 1/4W	
A1R16	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	
A1R17	0683-3015	R:FXD COMP 300 OHM 5% 1/4W	
A1R18	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	
A1R19	0683-3925	R:FXD COMP 3900 OHM 5% 1/4W	
A1R20	0683-3905	R:FXD COMP 39 OHM 5% 1/4W	
A1R21	0757-0284	R:FXD MET FLM 150 OHM 1% 1/8W	
A1R22	0757-0284	R:FXD MET FLM 150 OHM 1% 1/8W	
A1T1	05100-6172	TRANSFORMER-1.7UH	
A1T2	05100-6172	TRANSFORMER-1.7UH	
A2	05100 6047 05100-2047 05100-2039	BOARD ASSY.-FILTER BOARD-ETCHED CKT. STRIP-GROUND	
A2C51	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C52	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C53	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C54	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C55	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C56	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C57 THRU		NOT ASSIGNED	
A2C60			
A2C61	0160-0337	C:FXD MICA 160PF 1%	
A2C62	0160-0342	C:FXD MICA 800PF 1%	
A2C63	0160-0330	C:FXD CER 6.6PF +/-0.1PF	
A2C64	0140-0220	C:FXD MICA 200PF 1% 300VDCW	
A2C65	0140-0177	C:FXD MICA 400 PF 1% 300 VDCW	
A2C66	0160-0338	C:FXD MICA 267PF 1%	
A2C67	0160-0338	C:FXD MICA 267PF 1%	
A2C68	0160-0329	C:FXD CER 6.0PF +/-0.1PF	
A2C69	0160-0332	C:FXD MICA 133PF 1%	
A2C70	0160-0328	C:FXD CER 4.6PF +/-0.1PF	
A2C71	0160-0332	C:FXD MICA 133PF 1%	
A2C72	0160-0330	C:FXD CER 6.6PF +/-0.1PF	
A2C73	0140-0220	C:FXD MICA 200PF 1% 300VDCW	
A2C74	0140-0177	C:FXD MICA 400 PF 1% 300 VDCW	
A2C75	0150-0055	C:FXD T1 10 PF 5% 500 VDCW	
A2C76	0160-0336	C:FXD MICA 100PF 1%	
A2C77	0160-0333	C:FXD MICA 15PF +/-0.5PF	
A2C78		N.S.R. PART OF Z1	
A2C79 THRU		NOT ASSIGNED	
A2C90			

See list of abbreviations in introduction to this section

Table 6-7. Mixer/Filter Module A12 (05100-6002) Cont'd.
(Prefix all parts in this table A12)

Reference Designation	Stock No.	Description #	Note
A2C91	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C92	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C93	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C94	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C95	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2C96	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A2L51	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L52	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L53	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L54 THRU			
A2L60		NOT ASSIGNED	
A2L61	05100-6166	COIL-VARIABLE .17-.22UH	
A2L62	9170-0105	CORE:ADJUSTABLE TUNING	
	05100-6166	COIL-VARIABLE .17-.22UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A2L63	9140-0114	COIL:FXD RF 10 UH	
A2L64	05100-6166	COIL-VARIABLE .17-.22UH	
A2L65	9170-0105	CORE:ADJUSTABLE TUNING	
	05100-6166	COIL-VARIABLE .17-.22UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A2L66	05100-6166	COIL-VARIABLE .17-.22UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A2L67	05100-6166	COIL-VARIABLE .17-.22UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A2L68 THRU		N.S.R. PART OF Z1	
A2L69			
A2L80		NOT ASSIGNED	
A2L81	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L82	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L83	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2Q51	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q52	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q53	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2R51	0757-0281	R:FXD MET FLM 2.74 K OHM 1% 1/8W	
A2R52	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	
A2R53	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	
A2R54	0683-3025	R:FXD COMP 3000 OHM 5% 1/4W	
A2R55	0757-0280	R:FXD MET FLM 1000 OHM 1% 1/8W	
A2R56	0683-3025	R:FXD COMP 3000 OHM 5% 1/4W	
A2R57	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	
A2R58	0683-3025	R:FXD COMP 3000 OHM 5% 1/4W	
A2R59	0683-1515	R:FXD COMP 150 OHM 5% 1/4W	
A2R60	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	
A2R61	0757-0279	R:FXD MET FLM 3.16K OHM 1% 1/8W	
A2R62	0757-0277	R:FXD MET FLM 49.9 OHM 1% 1/8W	
A2R63	0757-0274	R:FXD MET FLM 1.21K 1% 1/8W	
A2R64	2100-1429	R:VAR Ww 2000 OHM 5% 1W	
A2T51	05100-6179	TRANSFORMER-VARIABLE	
A2	9170-0106	CORE:ADJUSTABLE TUNING	
	05100-6182	COUPLER-30MC	

See list of abbreviations in introduction to this section

Table 6-7. Mixer/Filter Module A12 (05100-6002) Cont'd.
(Prefix all parts in this table A12)

Reference Designation	Ⓢ Stock No.	Description #	Note
		MISCELLANEOUS	
	05100-6023	ASSY.-DECADE MIXER BD.	
	05100-6047	ASSY.-DECADE FILTER BD.	
	05100-6069	ASSY.-CABLE 30 MC OUT	
	05100-6070	ASSY.-CABLE 30 MC CONNECT	
	05100-6071	ASSY.-CABLE BUSS FREQ.	
	05100-6073	ASSY.-CABLE 12.6V	
	05100-6074	ASSY.-CABLE 6.3V	
	05100-6076	ASSY.-CABLE 3 MC	
	05100-6077	ASSY.-CABLE 24 MC	
	05100-6078	ASSY.-CLAMP	
	05100-2034	BAR-REAR DECADE	
	05100-2033	BAR-FRONT DECADE	
	05100-0010	BRACKET-DECADE	
	05100-0018	BRACKET-END	
	05100-0019	COVER-DECADE(#1)	
	05100-2032	CONNECTOR-DECADE	
	05100-6002	FILTER ASSY. 30-31 MC MIXER	
	0510-0124	NUT:CAPTIVE 6-32 ST CP	

See list of abbreviations in introduction to this section

Table 6-8. 39 to 390 Mc Multiplier Module A13 (05100-6016)
(Prefix all parts in this table A13)

Reference Designation	Stock No.	Description #	Note
A1	05100-6035 05100-2019	BOARD ASSY:39/390 MC MULTIPLIER BOARD- MULTIPLIER	
A1C1	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C2	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C3	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C4	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C5	0160-0357	C:FXD CER 85PF 5% 500VDCW	
A1C6	0150-0042	C:FXD TI 4.7 PF 5% 500 VDCW	
A1C7	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C8	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C9	0130-0017	C:VAR CER 8-50 PF N750	
A1C10	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C11 THRU A1C15		NOT ASSIGNED	
A1C16	0150-0050	C:FXD CER 1000PF 600 VDCW	
A1C17	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C18	0130-0017	C:VAR CER 8-50 PF N750	
A1C19	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C20	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C21	0140-0215	C:FXD MICA 80PF 2% 300VDCW	
A1C22	0160-0368	C:FXD MICA 16PF 5%	
A1C23	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C24	0130-0017	C:VAR CER 8-50 PF N750	
A1C25	0130-0018	C:VAR CER 1.5-7 PF 500	
A1CR1	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1CR2	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1CR3	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1CR4	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1CR5	1901-0128	SEMICON DEVICE:DIODE SILICON STEP-RECOVERY	
A1CR6	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L2	05100-6186 9170-0105	COIL ASSY.- VARIABLE .16-.23UH CORE:ADJUSTABLE TUNING	
A1L3	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L4	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L5	9140-0095	COIL:FXD RF: 0.27UH	
A1L6	9140-0095	COIL:FXD RF: 0.27UH	
A1L7	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L8	05100-6186 9170-0105	COIL ASSY.- VARIABLE .16-.23UH CORE:ADJUSTABLE TUNING	
A1L9		N.S.R. PART OF A1	
A1Q1	1850-0118 1205-0031	TRANSISTOR-PNP GERMANIUM EIA 2N2360 HEAT SINK:TRANSISTOR	
A1Q2	1850-0121	TRANSISTOR:GERMANIUM PNP 2N2402	
A1Q3	1850-0020	TRANSISTOR:GERMANIUM 2N1143 PNP	
A1Q4	1850-0062	TRANSISTOR:GERMANIUM SPL 2N404	
A1Q5	1850-0062	TRANSISTOR:GERMANIUM SPL 2N404	
A1R1	0727-0036	R:FXD DEPC 71.16 OHM 1% 1/2W	

Table 6-8. 39 to 390 Mc Multiplier Module A13 (05100-6016) Cont'd.
(Prefix all parts in this table A13)

Reference Designation	Stock No.	Description #	Note
A1R2	0683-1525	R:FXD COMP 150 OHM 5% 1/4W	
A1R3	0683-1525	R:FXD COMP 150 OHM 5% 1/4W	
A1R4	0683-7515	R:FXD COMP 750 OHM 5% 1/4W	
A1R5	0683-7515	R:FXD COMP 750 OHM 5% 1/4W	
A1R6	0683-1325	R:FXD COMP 1300 OHM 5% 1/4W	
A1R7	0683-6215	R:FXD COMP 620 OHM 5% 1/4W	
A1R8	0683-5115	R:FXD COMP 510 OHM 5% 1/4W	
A1R9	0683-1035	R:FXD COMP 10K OHM 5% 1/4 W	
A1R10	0683-1035	R:FXD COMP 10K OHM 5% 1/4 W	
A1R11	0683-1815	R:FXD COMP 180 OHM 5% 1/4W	
A1R12	0683-5105	R:FXD COMP 51 OHM 5% 1/4W	
A1R13	0757-0076	R:FXD MET FLM 560 OHM 2% 1/2W	
A1R14	0683-2225	R:FXD COMP 2.2K OHM 5% 1/4W	
A1R15	2100-0941	R:VAR WW 1000 OHM 5%	
A1R16	0758-0003	R:FXD MET FLM 1000 OHM 5% 1/2W	
A1R17	0758-0003	R:FXD MET FLM 1000 OHM 5% 1/2W	
A1R18	0683-2235	R:FXD COMP 22K OHM 5% 1/4W	
A1T1	05100-6163	TRANSFORMER- INPUT DOUBLER	
C1	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C2	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C3	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C4	0140-0192	C:FXD MICA 68PF 5% 300VDCW	
J1	1250-0083	CONNECTOR:8NC	
J2	1250-0083	CONNECTOR:8NC	
		MISCELLANEOUS	
	05100-0084	COVER- MULTIPLIER 39/390 MC	
	05100-6164	CHASSIS ASSY.- MULTIPLIER	

See list of abbreviations in introduction to this section

Table 6-9. 38 to 380 Mc Multiplier Module A14 (05100-6017)
(Prefix all parts in this table A14)

Reference Designation	Stock No.	Description #	Note
A1	05100-6036 05100-2020	BOARD ASSY.- 38/380 MC BLANK BOARD- MULTIPLIER	
A1C1	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C2	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C3	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C4	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C5	0160-0357	C:FXD CER 85PF 5% 500VDCW	
A1C6	0150-0042	C:FXD TI 4.7 PF 5% 500 VDCW	
A1C7	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C8	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C9	0130-0017	C:VAR CER 8-50 PF N750	
A1C10	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C11 THRU A1C15 A1C16 A1C17 A1C18 A1C19	0150-0050 0160-2055 0130-0017 0160-2055	NOT ASSIGNED C:FXD CER 1000PF 600 VDCW C:FXD CER 0.01UF +80-20% 100VDCW C:VAR CER 8-50 PF N750 C:FXD CER 0.01UF +80-20% 100VDCW	
A1C20 A1C21 A1C22 A1C23 A1C24	0160-2055 0140-0215 0160-0369 0160-2055 0130-0017	C:FXD CER 0.01UF +80-20% 100VDCW C:FXD MICA 80PF 2% 300VDCW C:FXD MICA 17PF 5% C:FXD CER 0.01UF +80-20% 100VDCW C:VAR CER 8-50 PF N750	
A1C25	0130-0018	C:VAR CER 1.5-7 PF 500	
A1CR1 A1CR2 A1CR3 A1CR4 A1CR5	1910-0022 1910-0022 1910-0022 1910-0022 1901-0128	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS SEMICON DEVICE:DIODE SILICON STEP-RECOVERY	
A1CR6	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1L1 A1L2 A1L3 A1L4	9140-0179 05100-6186 9170-0105 9140-0179 9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA COIL ASSY.- VARIABLE .16-.23UH CORE:ADJUSTABLE TUNING COIL-FXD R.F. 22 UH 10% 275 MA COIL-FXD R.F. 22 UH 10% 275 MA	
A1L5 A1L6 A1L7 A1L8	9140-0095 9140-0095 9140-0179 05100-6186 9170-0105	COIL:FXD RF: 0.27UH COIL:FXD RF: 0.27UH COIL-FXD R.F. 22 UH 10% 275 MA COIL ASSY.- VARIABLE .16-.23UH CORE:ADJUSTABLE TUNING	
A1L9		N.S.R. PART OF A1	
A1Q1 A1Q2 A1Q3 A1Q4	1850-0118 1205-0031 1850-0121 1850-0020 1850-0062	TRANSISTOR-PNP GERMANIUM EIA 2N2360 HEAT SINK:TRANSISTOR TRANSISTOR:GERMANIUM PNP 2N2402 TRANSISTOR GERMANIUM 2N1143 PNP TRANSISTOR:GERMANIUM SPL 2N404	
A1Q5 A1Q6	1850-0062 1854-0005	TRANSISTOR:GERMANIUM SPL 2N404 TRANSISTOR:2N708 NPN SILICON	

See list of abbreviations in introduction to this section

Table 6-9. 38 to 380 Mc Multiplier Module A14 (05100-6017) Cont'd.
(Prefix all parts in this table A14)

Reference Designation	Stock No.	Description #	Note
A1R1	0727-0036	R:FXD DEPC 71.16 OHM 1% 1/2W	
A1R2	0683-1525	R:FXD COMP 150 OHM 5% 1/4W	
A1R3	0683-1525	R:FXD COMP 150 OHM 5% 1/4W	
A1R4	0683-7515	R:FXD COMP 750 OHM 5% 1/4W	
A1R5	0683-7515	R:FXD COMP 750 OHM 5% 1/4W	
A1R6	0683-1325	R:FXD COMP 1300 OHM 5% 1/4W	
A1R7	0683-6215	R:FXD COMP 620 OHM 5% 1/4W	
A1R8	0683-5115	R:FXD COMP 510 OHM 5% 1/4W	
A1R9 THRU		NOT ASSIGNED	
A1R10			
A1R11	0683-1815	R:FXD COMP 180 OHM 5% 1/4W	
A1R12	0683-5105	R:FXD COMP 51 OHM 5% 1/4W	
A1R13	0757-0076	R:FXD MET FLM 560 OHM 2% 1/2W	
A1R14	0683-2225	R:FXD COMP 2.2K OHM 5% 1/4W	
A1R15	2100-0941	R:VAR WW 1000 OHM 5%	
A1R16	0758-0003	R:FXD MET FLM 1000 OHM 5% 1/2W	
A1R17	0758-0003	R:FXD MET FLM 1000 OHM 5% 1/2W	
A1R18	0683-2235	R:FXD COMP 22K OHM 5% 1/4W	
A1R19	0683-1035	R:FXD COMP 10K OHM 5% 1/4 W	
A1R20	0683-2225	R:FXD COMP 2.2K OHM 5% 1/4W	
A1R21	0683-3325	R:FXD COMP 3300 OHM 5% 1/4W	
A1T1	05100-6163	TRANSFORMER- INPUT DOUBLER	
C1	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C2	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C3	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C4	0140-0192	C:FXD MICA 68PF 5% 300VDCW	
J1	1250-0083	CONNECTOR:BNC	
J2	1250-0083	CONNECTOR:BNC	
		MISCELLANEOUS	
	05100-0083	COVER- MULTIPLIER 38/380 MC	
	05100-6164	CHASSIS ASSY.- MULTIPLIER	

See list of abbreviations in introduction to this section

Table 6-10. 37 to 370 Mc Multiplier Module A15 (05100-6018)
(Prefix all parts in this table A15)

Reference Designation	Stock No.	Description #	Note
A1	05100-6161 05100-2020	BOARD ASSY.- 37/370 MC BLANK BOARD: MULTIPLIER	
A1C1	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C2	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C3	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C4	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C5	0160-0358	C:FXD CER 94PF 5% 500VDCW	
A1C6	0150-0042	C:FXD T1 4.7 PF 5% 500 VDCW	
A1C7	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C8	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C9	0130-0017	C:VAR CER 8-50 PF N750	
A1C10	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C11 THRU A1C15		NOT ASSIGNED	
A1C16	0150-0050	C:FXD CER 1000PF 600 VDCW	
A1C17	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C18	0130-0017	C:VAR CER 8-50 PF N750	
A1C19	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C20	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C21	0140-0215	C:FXD MICA 80PF 2% 300VDCW	
A1C22	0160-0356	C:FXD MICA 18PF 5%	
A1C23	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C24	0130-0017	C:VAR CER 8-50 PF N750	
A1C25	0130-0018	C:VAR CER 1.5-7 PF 500	
A1CR1	1910-0022	SEMICON DEVICE: DIODE GE 100MA 6PIV 3.5NS	
A1CR2	1910-0022	SEMICON DEVICE: DIODE GE 100MA 6PIV 3.5NS	
A1CR3	1910-0022	SEMICON DEVICE: DIODE GE 100MA 6PIV 3.5NS	
A1CR4	1910-0022	SEMICON DEVICE: DIODE GE 100MA 6PIV 3.5NS	
A1CR5	1901-0128	SEMICON DEVICE: DIODE SILICON STEP-RECOVERY	
A1CR6	1910-0022	SEMICON DEVICE: DIODE GE 100MA 6PIV 3.5NS	
A1L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L2	05100-6186 9170-0105	COIL ASSY.- VARIABLE .16-.23UH CORE: ADJUSTABLE TUNING	
A1L3	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L4	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L5	9140-0095	COIL: FXD RF: 0.27UH	
A1L6	9140-0095	COIL: FXD RF: 0.27UH	
A1L7	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L8	05100-6186 9170-0105	COIL ASSY.- VARIABLE .16-.23UH CORE: ADJUSTABLE TUNING	
A1L9		N.S.R. PART OF A1	
A1Q1	1850-0118 1205-0031	TRANSISTOR-PNP GERMANIUM EIA 2N2360 HEAT SINK: TRANSISTOR	
A1Q2	1850-0121	TRANSISTOR: GERMANIUM PNP 2N2402	
A1Q3	1850-0020	TRANSISTOR GERMANIUM 2N1143 PNP	
A1Q4	1850-0062	TRANSISTOR: GERMANIUM SPL 2N404	
A1Q5	1850-0062	TRANSISTOR: GERMANIUM SPL 2N404	
A1Q6	1854-0005	TRANSISTOR: 2N708 NPN SILICON	

= See list of abbreviations in introduction to this section

Table 6-10. 37 to 370 Mc Multiplier Module A15 (05100-6018) Cont'd.
(Prefix all parts in this table A15)

Reference Designation	Stock No.	Description #	Note
A1R1	0727-0036	R:FXD DEPC 71.16 OHM 1% 1/2W	
A1R2	0683-1525	R:FXD COMP 150 OHM 5% 1/4W	
A1R3	0683-1525	R:FXD COMP 150 OHM 5% 1/4W	
A1R4	0683-7515	R:FXD COMP 750 OHM 5% 1/4W	
A1R5	0683-7515	R:FXD COMP 750 OHM 5% 1/4W	
A1R6	0683-1325	R:FXD COMP 1300 OHM 5% 1/4W	
A1R7	0683-6215	R:FXD COMP 620 OHM 5% 1/4W	
A1R8	0683-5115	R:FXD COMP 510 OHM 5% 1/4W	
A1R9 THRU			
A1R10		NOT ASSIGNED	
A1R11	0683-1815	R:FXD COMP 180 OHM 5% 1/4W	
A1R12	0683-5105	R:FXD COMP 51 OHM 5% 1/4W	
A1R13	0757-0076	R:FXD MET FLM 560 OHM 2% 1/2W	
A1R14	0683-2225	R:FXD COMP 2.2K OHM 5% 1/4W	
A1R15	2100-0941	R:VAR WW 1000 OHM 5%	
A1R16	0758-0003	R:FXD MET FLM 1000 OHM 5% 1/2W	
A1R17	0758-0003	R:FXD MET FLM 1000 OHM 5% 1/2W	
A1R18	0683-2235	R:FXD COMP 22K OHM 5% 1/4W	
A1R19	0683-1035	R:FXD COMP 10K OHM 5% 1/4 W	
A1R20	0683-2225	R:FXD COMP 2.2K OHM 5% 1/4W	
A1R21	0683-3325	R:FXD COMP 3300 OHM 5% 1/4W	
A1T1	05100-6163	TRANSFORMER- INPUT DOUBLER	
C1	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C2	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C3	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C4	0140-0192	C:FXD MICA 68PF 5% 300VDCW	
J1	1250-0083	CONNECTOR:BNC	
J2	1250-0083	CONNECTOR:BNC	
		MISCELLANEOUS	
	05100-0082	COVER- MULTIPLIER 37/370 MC	
	05100-6164	CHASSIS ASSY.- MULTIPLIER	

See list of abbreviations in introduction to this section

Table 6-11. 36 to 360 Mc Multiplier Module A16 (05100-6019)
(Prefix all parts in this table A16)

Reference Designation	Stock No.	Description #	Note
A1	05100-6037 05100-2020	BOARD ASSY.- 36/360 MC MULTIPLIER BOARD- MULTIPLIER	
A1C1	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C2	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C3	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C4	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C5	0160-0358	C:FXD CER 94PF 5% 500VDCW	
A1C6	0150-0042	C:FXD T1 4.7 PF 5% 500 VDCW	
A1C7	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C8	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C9	0130-0017	C:VAR CER 8-50 PF N750	
A1C10	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C11 THRU A1C15		NOT ASSIGNED	
A1C16	0150-0050	C:FXD CER 1000PF 600 VDCW	
A1C17	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C18	0130-0017	C:VAR CER 8-50 PF N750	
A1C19	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C20	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C21	0140-0215	C:FXD MICA 80PF 2% 300VDCW	
A1C22	0160-0370	C:FXD MICA 20PF 5%	
A1C23	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C24	0130-0017	C:VAR CER 8-50 PF N750	
A1C25	0130-0018	C:VAR CER 1.5-7 PF 500	
A1CR1	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1CR2	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1CR3	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1CR4	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1CR5	1901-0127	SEMICON DEVICE:DIODE SILICON STEP-RECOVERY	
A1CR6	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L2	05100-6186	COIL ASSY.- VARIABLE .16-.23UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L3	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L4	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L5	9140-0095	COIL:FXD RF: 0.27UH	
A1L6	9140-0095	COIL:FXD RF: 0.27UH	
A1L7	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L8	05100-6186	COIL ASSY.- VARIABLE .16-.23UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L9		N.S.R. PART OF A1	
A1Q1	1850-0118 1205-0031	TRANSISTOR-FNP GERMANIUM EIA 2N2360 HEAT SINK:TRANSISTOR	
A1Q2	1850-0121	TRANSISTOR:GERMANIUM PNP 2N2402	
A1Q3	1850-0020	TRANSISTOR GERMANIUM 2N1143 PNP	
A1Q4	1850-0062	TRANSISTOR:GERMANIUM SPL 2N404	
A1Q5	1850-0062	TRANSISTOR:GERMANIUM SPL 2N404	
A1Q6	1854-0005	TRANSISTOR:2N708 NPN SILICON	

See list of abbreviations in introduction to this section

Table 6-11. 36 to 360 Mc Multiplier Module A16 (05100-6019) Cont'd.
(Prefix all parts in this table A16)

Reference Designation	Stock No.	Description #	Note
A1R1	0727-0036	R:FXD DEPC 71.16 OHM 1% 1/2W	
A1R2	0683-1525	R:FXD COMP 150 OHM 5% 1/4W	
A1R3	0683-1525	R:FXD COMP 150 OHM 5% 1/4W	
A1R4	0683-7515	R:FXD COMP 750 OHM 5% 1/4W	
A1R5	0683-7515	R:FXD COMP 750 OHM 5% 1/4W	
A1R6	0683-1325	R:FXD COMP 1300 OHM 5% 1/4W	
A1R7	0683-6215	R:FXD COMP 620 OHM 5% 1/4W	
A1R8	0683-5115	R:FXD COMP 510 OHM 5% 1/4W	
A1R9	THRU		
A1R10		NOT ASSIGNED	
A1R11	0683-1815	R:FXD COMP 180 OHM 5% 1/4W	
A1R12	0683-5105	R:FXD COMP 51 OHM 5% 1/4W	
A1R13	0757-0076	R:FXD MET FLM 560 OHM 2% 1/2W	
A1R14	0683-2225	R:FXD COMP 2.2K OHM 5% 1/4W	
A1R15	2100-0941	R:VAR WW 1000 OHM 5%	
A1R16	0758-0003	R:FXD MET FLM 1000 OHM 5% 1/2W	
A1R17	0758-0003	R:FXD MET FLM 1000 OHM 5% 1/2W	
A1R18	0683-2235	R:FXD COMP 22K OHM 5% 1/4W	
A1R19	0683-1035	R:FXD COMP 10K OHM 5% 1/4 W	
A1R20	0683-2225	R:FXD COMP 2.2K OHM 5% 1/4W	
A1R21	0683-3325	R:FXD COMP 3300 OHM 5% 1/4W	
A1T1	05100-6163	TRANSFORMER- INPUT DOUBLER	
C1	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C2	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C3	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C4	0140-0192	C:FXD MICA 68PF 5% 300VDCW	
J1	1250-0083	CONNECTOR:BNC	
J2	1250-0083	CONNECTOR:BNC	
		MISCELLANEOUS	
	05100-0081	COVER- MULTIPLIER 36/360 MC	
	05100-6164	CHASSIS ASSY.- MULTIPLIER	

See list of abbreviations in introduction to this section

Table 6-12. 35 to 350 Mc Multiplier Module A17 (05100-6020)
(Prefix all parts in this table A17)

Reference Designation	Stock No.	Description #	Note
A1	05100-6162 05100-2020	BOARD ASSY.- 35/350 MC BLANK BOARD- MULTIPLIER	
A1C1	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C2	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C3	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C4	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C5	0160-0359	C:FXD CER 103PF 5% 500VDCW	
A1C6	0150-0042	C:FXD T1 4.7 PF 5% 500 VDCW	
A1C7	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C8	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C9	0130-0017	C:VAR CER 8-50 PF N750	
A1C10	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C11 THRU A1C15		NOT ASSIGNED	
A1C16	0150-0050	C:FXD CER 1000PF 600 VDCW	
A1C17	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C18	0130-0017	C:VAR CER 8-50 PF N750	
A1C19	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C20	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C21	0140-0215	C:FXD MICA 80PF 2% 300VDCW	
A1C22	0140-0145	C:FXD MICA 22 PF 5% 500 VDCW	
A1C23	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C24	0130-0017	C:VAR CER 8-50 PF N750	
A1C25	0130-0018	C:VAR CER 1.5-7 PF 500	
A1CR1	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1CR2	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1CR3	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1CR4	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1CR5	1901-0127	SEMICON DEVICE:DIODE SILICON STEP-RECOVERY	
A1CR6	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L2	05100-6186 9170-0105	COIL ASSY.- VARIABLE .16-.23UH CORE:ADJUSTABLE TUNING	
A1L3	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L4	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L5	9140-0095	COIL:FXD RF: 0.27UH	
A1L6	9140-0095	COIL:FXD RF: 0.27UH	
A1L7	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L8	05100-6186 9170-0105	COIL ASSY.- VARIABLE .16-.23UH CORE:ADJUSTABLE TUNING	
A1L9		N.S.R. PART OF A1	
A1Q1	1850-0118 1205-0031	TRANSISTOR-PNP GERMANIUM EIA 2N2360 HEAT SINK:TRANSISTOR	
A1Q2	1850-0121	TRANSISTOR:GERMANIUM PNP 2N2402	
A1Q3	1850-0020	TRANSISTOR GERMANIUM 2N1143 PNP	
A1Q4	1850-0062	TRANSISTOR:GERMANIUM SPL 2N404	
A1Q5	1850-0062	TRANSISTOR:GERMANIUM SPL 2N404	
A1Q6	1854-0005	TRANSISTOR:2N708 NPN SILICON	

≡ See list of abbreviations in introduction to this section

Table 6-12. 35 to 350 Mc Multiplier Module A17 (05100-6020) Cont'd.
(Prefix all parts in this table A17)

Reference Designation	Stock No.	Description #	Note
A1R1	0727-0036	R:FXD DEPC 71.16 OHM 1% 1/2W	
A1R2	0683-1525	R:FXD COMP 150 OHM 5% 1/4W	
A1R3	0683-1525	R:FXD COMP 150 OHM 5% 1/4W	
A1R4	0683-7515	R:FXD COMP 750 OHM 5% 1/4W	
A1R5	0683-7515	R:FXD COMP 750 OHM 5% 1/4W	
A1R6	0683-1325	R:FXD COMP 1300 OHM 5% 1/4W	
A1R7	0683-6215	R:FXD COMP 620 OHM 5% 1/4W	
A1R8	0683-5115	R:FXD COMP 510 OHM 5% 1/4W	
A1R9 THRU			
A1R10		NOT ASSIGNED	
A1R11	0683-1815	R:FXD COMP 180 OHM 5% 1/4W	
A1R12	0683-5105	R:FXD COMP 51 OHM 5% 1/4W	
A1R13	0757-0076	R:FXD MET FLM 560 OHM 2% 1/2W	
A1R14	0683-2225	R:FXD COMP 2.2K OHM 5% 1/4W	
A1R15	2100-0941	R:VAR WW 1000 OHM 5%	
A1R16	0758-0003	R:FXD MET FLM 1000 OHM 5% 1/2W	
A1R17	0758-0003	R:FXD MET FLM 1000 OHM 5% 1/2W	
A1R18	0683-2235	R:FXD COMP 22K OHM 5% 1/4W	
A1R19	0683-1035	R:FXD COMP 10K OHM 5% 1/4 W	
A1R20	0683-2225	R:FXD COMP 2.2K OHM 5% 1/4W	
A1R21	0683-3325	R:FXD COMP 3300 OHM 5% 1/4W	
A1T1	05100-6163	TRANSFORMER- INPUT DOUBLER	
C1	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C2	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C3	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C4	0140-0192	C:FXD MICA 68PF 5% 300VDCW	
J1	1250-0083	CONNECTOR:BNC	
J2	1250-0083	CONNECTOR:BNC	
		MISCELLANEOUS	
	05100-6164	CHASSIS ASSY.- MULTIPLIER	
	05100-0080	COVER- MULTIPLIER 35/350	

See list of abbreviations in introduction to this section

Table 6-13. 33 to 330 Mc Multiplier Module A18 (05100-6021)
(Prefix all parts in this table A18)

Reference Designation	Stock No.	Description #	Note
A1	05100-6038 05100-2021	BOARD ASSY.- 33/330 MC BLANK BOARD- MULTIPLIER	
A1C1	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C2	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C3	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C4	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C5	0160-0360	C:FXD CER 120PF 5% 500VDCW	
A1C6	0150-0042	C:FXD TI 4.7 PF 5% 500 VDCW	
A1C7	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C8	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C9	0130-0017	C:VAR CER 8-50 PF N750	
A1C10	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C11 THRU A1C15		NOT ASSIGNED	
A1C16	0150-0050	C:FXD CER 1000PF 600 VDCW	
A1C17	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C18	0130-0017	C:VAR CER 8-50 PF N750	
A1C19	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C20	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C21	0140-0215	C:FXD MICA 80PF 2% 300VDCW	
A1C22	0140-0145	C:FXD MICA 22 PF 5% 500 VDCW	
A1C23	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C24	0130-0017	C:VAR CER 8-50 PF N750	
A1C25	0130-0018	C:VAR CER 1.5-7 PF 500	
A1CR1	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1CR2	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1CR3	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1CR4	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1CR5	1901-0127	SEMICON DEVICE:DIODE SILICON STEP-RECOVERY	
A1CR6	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L2	05100-6186 9170-0105	COIL ASSY.- VARIABLE .16-.23UH CORE:ADJUSTABLE TUNING	
A1L3	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L4	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L5	9140-0095	COIL:FXD RF: 0.27UH	
A1L6	9140-0095	COIL:FXD RF: 0.27UH	
A1L7	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L8	05100-6186 9170-0105	COIL ASSY.- VARIABLE .16-.23UH CORE:ADJUSTABLE TUNING	
A1L9		N.S.R. PART OF A1	
A1Q1	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A1Q1	1205-0031	HEAT SINK:TRANSISTOR	
	1850-0121	TRANSISTOR:GERMANIUM PNP 2N2402	
A1Q3	1850-0020	TRANSISTOR:GERMANIUM 2N1143 PNP	
A1Q4	1850-0062	TRANSISTOR:GERMANIUM SPL 2N404	
A1R1	0727-0036	R:FXD DEPC 71.16 OHM 1% 1/2W	
A1R2	0683-1525	R:FXD COMP 150 OHM 5% 1/4W	

See list of abbreviations in introduction to this section

Table 6-13. 33 to 330 Mc Multiplier Module A18 (05100-6021) Cont'd.
(Prefix all parts in this table A18)

Reference Designation	Stock No.	Description #	Note
A1R3	0683-1525	R:FXD COMP 150 OHM 5% 1/4W	
A1R4	0683-7515	R:FXD COMP 750 OHM 5% 1/4W	
A1R5	0683-7515	R:FXD COMP 750 OHM 5% 1/4W	
A1R6	0683-1325	R:FXD COMP 1300 OHM 5% 1/4W	
A1R7	0683-6215	R:FXD COMP 620 OHM 5% 1/4W	
A1R8	0683-5115	R:FXD COMP 510 OHM 5% 1/4W	
A1R9 THRU			
A1R10		NOT ASSIGNED	
A1R11	0683-1815	R:FXD COMP 180 OHM 5% 1/4W	
A1R12	0683-5105	R:FXD COMP 51 OHM 5% 1/4W	
A1R13	0757-0076	R:FXD MET FLM 560 OHM 2% 1/2W	
A1R14	0683-2225	R:FXD COMP 2.2K OHM 5% 1/4W	
A1R15	2100-0941	R:VAR WW 1000 OHM 5%	
A1R16	0758-0003	R:FXD MET FLM 1000 OHM 5% 1/2W	
A1R17	0758-0003	R:FXD MET FLM 1000 OHM 5% 1/2W	
A1R18	0683-2235	R:FXD COMP 22K OHM 5% 1/4W	
A1T1	05100-6163	TRANSFORMER- INPUT DOUBLER	
C1	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C2	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C3	0140-0192	C:FXD MICA 68PF 5% 300VDCW	
J1	1250-0083	CONNECTOR:BNC	
J2	1250-0083	CONNECTOR:BNC	
		MISCELLANEOUS	
	05100-0012	COVER- MULTIPLIER 33/330 MC	
	05100-6164	CHASSIS ASSY.- MULTIPLIER	

See list of abbreviations in introduction to this section

Table 6-14. 30 to 39 Mc Switch Module A19 (05100-6010)
(Prefix all parts in this table A19)

Reference Designation	Stock No.	Description #	Note
A1	05100-6033 05100-2011	BOARD ASSY.-SWITCH BLANK BOARD- SWITCH	
A1C1	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C2	0150-0050	C:FXD CER 1000PF 600 VDCW	
A1C3	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C4	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1CR1	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR2	1901-0025	SEMICON DEVICE:DIODE JUNCTION	
A1CR3	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR4	1901-0025	SEMICON DEVICE:DIODE JUNCTION	
A1CR5	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1R1	0683-2425	R:FXD COMP 2400 OHM 5% 1/4W	
A1R2	0683-1225	R:FXD COMP 1200 OHM 5% 1/4W	
A1R3	0683-2425	R:FXD COMP 2400 OHM 5% 1/4W	
A1R4	0683-2425	R:FXD COMP 2400 OHM 5% 1/4W	
A2	05100-6033	SAME AS A1 PREFIX A2	
A3	05100-6033	SAME AS A1 PREFIX A3	
A4	05100-6033	SAME AS A1 PREFIX A4	
A5	05100-6033	SAME AS A1 PREFIX A5	
A6	05100-6033	SAME AS A1 PREFIX A6	
A7	05100-6033	SAME AS A1 PREFIX A7	
A8	05100-6033	SAME AS A1 PREFIX A8	
A9	05100-6033	SAME AS A1 PREFIX A9	
A10	05100-6033	SAME AS A1 PREFIX A10	
A11	05100-6034	OUTPUT BOARD ASSEMBLY	
A11C1	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A11C2	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A11C3	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A11C4	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A11L1	9140-0159	COIL:FXD 0.47UH 20%	
A11L2	9140-0181	COIL:FXD RF 22UH 5%	
A11Q1	1850-0075	TRANSISTOR:GERMANIUM 2N779A PNP	
A11R1	0683-2425	R:FXD COMP 2400 OHM 5% 1/4W	
A11R2	0683-3315	R:FXD COMP 330 OHM 5% 1/4W	
A11R3	0683-8215	R:FXD COMP 820 OHM 5% 1/4W	
A11R4	0757-0316	R:FXD MET FLM 42.2 OHM 1% 1/8W	
J1	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J2	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J3	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J4	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J5	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J6	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J7	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J8	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J9	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J10	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J11	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J12	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J13	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J14	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J15	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J16		NOT ASSIGNED	

See list of abbreviations in introduction to this section

Table 6-14. 30 to 39 Mc Switch Module A19 (05100-6010) Cont'd.
(Prefix all parts in this table A19)

Reference Designation	Stock No.	Description #	Note
J17	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J18	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J19	1251-0143	CONNECTOR:FEMALE 14-CONTACT JACK	
L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
R1	0758-0007	R:FXD MET FLM 150 OHM 5% 1/2W	
R2	0758-0007	R:FXD MET FLM 150 OHM 5% 1/2W	
R3	0758-0007	R:FXD MET FLM 150 OHM 5% 1/2W	
R4	0758-0007	R:FXD MET FLM 150 OHM 5% 1/2W	
R5	0758-0007	R:FXD MET FLM 150 OHM 5% 1/2W	
R6	0758-0094	R:FXD MET CX 62 OHM 5% 1/2W	
R7	0758-0007	R:FXD MET FLM 150 OHM 5% 1/2W	
R8	0758-0094	R:FXD MET CX 62 OHM 5% 1/2W	
R9	0758-0094	R:FXD MET CX 62 OHM 5% 1/2W	
R10	0758-0094	R:FXD MET CX 62 OHM 5% 1/2W	
		MISCELLANEOUS	
	05100-2023	COVER-SWITCH: BOTTOM	
	05100-2024	COVER-SWITCH: TOP	
	05100-0060	GASKET-TOP COVER	
	05100-2022	HOUSING-30/39 MC SWITCH	
	0360-0358	TERMINAL:PRESS-IN	

See list of abbreviations in introduction to this section

Table 6-15. 350 to 390 Mc Switch Module A20 (05100-6011)
(Prefix all parts in this table A20)

Reference Designation	Stock No.	Description #	Note
C1	0150-0093	C:FXD CER 0.01UF +80-20% 100VDCW	
C2	0150-0093	C:FXD CER 0.01UF +80-20% 100VDCW	
C3	0150-0093	C:FXD CER 0.01UF +80-20% 100VDCW	
C4	0150-0093	C:FXD CER 0.01UF +80-20% 100VDCW	
C5	0150-0093	C:FXD CER 0.01UF +80-20% 100VDCW	
CR1	1910-0030	SEMICON DEVICE:DIODE GERMANIUM	
CR2	1910-0030	SEMICON DEVICE:DIODE GERMANIUM	
CR3	1910-0030	SEMICON DEVICE:DIODE GERMANIUM	
CR4	1910-0030	SEMICON DEVICE:DIODE GERMANIUM	
CR5	1910-0030	SEMICON DEVICE:DIODE GERMANIUM	
J1	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J2	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J3	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J4	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J5	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J6	1250-0212	CONNECTOR:JACK CHASSIS BNC	
J7	THRU	NOT ASSIGNED	
J17		CONNECTOR:FEMALE 14-CONTACT JACK	
J18			
L1	9140-0159	COIL:FXD 0.47UH 20%	
L2	9140-0159	COIL:FXD 0.47UH 20%	
L3	9140-0159	COIL:FXD 0.47UH 20%	
L4	9140-0159	COIL:FXD 0.47UH 20%	
L5	9140-0159	COIL:FXD 0.47UH 20%	
L6	9140-0159	COIL:FXD 0.47UH 20%	
R1	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	
R2	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	
R3	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	
R4	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	
R5	0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	
MISCELLANEOUS			
	05100-2041	COVER-350-390 MC SWITCH	
	05100-2031	HOUSING-350-390 MC SWITCH	
	0340-0039	INSULATOR:BUSHING	
	0340-0036	TERMINAL:STUD	
	0360-0354	TERMINAL:STUD	
	0340-0038	TERMINAL:STUD	

See list of abbreviations in introduction to this section

Table 6-16. 1st UHF Mixer Module A21 (05100-6012)
(Prefix all parts in this table A21)

Reference Designation	Stock No.	Description #	Note
A1	05100-6040 05100-2014	BOARD ASSY.- FILTER BLANK-BOARD	
A1C1	0140-0225	C:FXD MICA 300PF 1% 300VDCW	
A1C2	0121-0061	C:VAR CER. DISK 5.5 -18 PF NPO 300 VDCW	
A1C3	0140-0190	C:FXD MICA 39 PF 5% 300 VDCW	
A1C4	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C5	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C6	0140-0178	C:FXD MICA 560 PF 2% 300 VDCW	
A1C7	0121-0061	C:VAR CER. DISK 5.5 -18 PF NPO 300 VDCW	
A1C8	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C9	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1L1	9140-0094	COIL:FXD RF: 0.68UH	
A1L2	9140-0188	COIL:FXD 0.56UH 10%	
A1L3	9140-0120	COIL:FXD 0.1 UH	
A1L4	9140-0120	COIL:FXD 0.1 UH	
A1R1	0758-0073	R:FXD MET FLM 24K OHM 5% 1/2W	
A1R2	0757-0298	R:FXD MET FLM 22K OHM 2% 1/2 W	
A1R3	2100-0741	R:VAR WW 5K OHM 5%	
A1R4	0758-0035	R:FXD MET FLM 3000 OHM 5% 1/2W	
A1R5	0757-0091	R:FXD MET FLM 18K OHM 2% 1/2W	
A1R6	0757-0298	R:FXD MET FLM 22K OHM 2% 1/2 W	
A1R7	0757-0298	R:FXD MET FLM 22K OHM 2% 1/2 W	
A1R8	0758-0035	R:FXD MET FLM 3000 OHM 5% 1/2W	
A2	05100-6039 05100-2013 05100-0020	BOARD ASSY.- MIXER BOARD-BLANK SHIELD	
A2C1	0121-0059	C:VAR CER. DISK 2PF TO 8 PF 300 VDCW NPO	
A2C2	0160-0375	C:FXD CER 2.2PF+/-0.1PF 300VDCW	
A2C3	0160-0375	C:FXD CER 2.2PF+/-0.1PF 300VDCW	
A2C4	0121-0059	C:VAR CER. DISK 2PF TO 8 PF 300 VDCW NPO	
A2C5	0140-0069	C:FXD MICA 550 PF 10% 500 VDCW	
A2C6	0121-0059	C:VAR CER. DISK 2PF TO 8 PF 300 VDCW NPO	
A2C7	0140-0069	C:FXD MICA 550 PF 10% 500 VDCW	
A2CR1	0122-0009	C:VOLTAGE VARIABLE (PAIR)	
A2CR2	0122-0009	C:VOLTAGE VARIABLE (PAIR)	
A2Q1	1850-0153	TRANSISTOR:GERMANIUM PNP	
A2R1	0757-0296	R:FXD MET FLM 200 OHM 2% 1/2W	
A2R2	0758-0003	R:FXD MET FLM 1000 OHM 5% 1/2W	
A2T1	05100-8003	TRANSFORMER- PUMP INPUT	
A2T2	05100-8010	TRANSFORMER- MIXER OUTPUT	
A2T3	05100-8011	TRANSFORMER- FINAL OUTPUT	
C1	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C2	0140-0192	C:FXD MICA 68PF 5% 300VDCW	
C3	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C4	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C5	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	

See list of abbreviations in introduction to this section

Table 6-16. 1st UHF Mixer Module A21 (05100-6012) Cont'd.
(Prefix all parts in this table A21)

Reference Designation	Stock No.	Description #	Note
E1	9170-0042	COIL:VAR 0.27-0.41UH	
J1	1250-0083	CONNECTOR:BNC	
J2		NOT ASSIGNED	
J3	1250-0083	CONNECTOR:BNC	
J4	THRU		
J8		NOT ASSIGNED	
J9		CONNECTOR:BNC	
L1	9140-0018	COIL:FXD 1UH	
L2	9140-0080	COIL:RF. 0.18 MH 10%	
L3	9140-0018	COIL:FXD 1UH	
		MISCELLANEOUS	
	05100-0002	BRACKET	
	05100-0005	COVER	
	05100-0014	FRAME	
	05100-2056	PLATE-END	
	0340-0039	INSULATOR:BUSHING	
	0340-0038	TERMINAL:STUD	

≡ See list of abbreviations in introduction to this section

Table 6-17. 2nd UHF Mixer Module A22 (05100-6013)
(Prefix all parts in this table A22)

Reference Designation	Stock No.	Description #	Note
A1	05100-6042 05100-2016	BOARD ASSY.- FILTER, 2ND MIXER BLANK BOARD	
A1C1	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C2	0140-0209	C:FXD MICA 5PF 10% 500VDCW	
A1C3	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C4	0140-0145	C:FXD MICA 22 PF 5% 500 VDCW	
A1C5	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C6	0140-0204	C:FXD MICA 47PF 5% NPO 500VDCW	
A1C7	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C8	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C9	0160-2055	C:FXD CER 0.01UF +80-20% 100VDCW	
A1C10	0150-0058	C:FXD CER 2.2 PF +/- NPO 600 VDCW	
A1L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L2	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L3	05100-8005	COIL-VARIABLE	
A1L4	9140-0080	COIL:RF. 0.18 MH 10%	
A1L5	05100-8006	COIL-VARIABLE	
A1L6	9140-0120	COIL:FXD 0.1 UH	
A1L7	9140-0120	COIL:FXD 0.1 UH	
A1Q1	1850-0119	TRANSISTOR-PNP GERMANIUM EIA 2N963	
A1R1	0683-6805	R:FXD COMP 68 OHM 5% 1/4W	
A1R2	0758-0017	R:FXD MET FLM 1500 OHM 5% 1/2W	
A1R3	0758-0017	R:FXD MET FLM 1500 OHM 5% 1/2W	
A1R4	0757-0092	R:FXD MET FLM 33K OHM 2% 1/2W	
A1R5	0757-0091	R:FXD MET FLM 18K OHM 2% 1/2W	
A1R6	0686-3905	R:FXD COMP 39 OHM 5% 1/2W	
A1R7	0757-0298	R:FXD MET FLM 22K OHM 2% 1/2 W	
A1R8	2100-0741	R:VAR WW 5K OHM 5%	
A1R9	0757-0298	R:FXD MET FLM 22K OHM 2% 1/2 W	
A1R10	0686-3905	R:FXD COMP 39 OHM 5% 1/2W	
A1R11	0757-0298	R:FXD MET FLM 22K OHM 2% 1/2 W	
A1R12	0758-0035	R:FXD MET FLM 3000 OHM 5% 1/2W	
A2	05100-6041 05100-2015 05100-0020	BOARD ASSY.- UHF, 2ND MIXER BLANK BOARD SHIELD	
A2C1	0121-0059	C:VAR CER. DISK 2PF TO 8 PF 300 VDCW NPO	
A2C2	0160-0374	C:FXD CER 1.8PF +/-0.1PF 500VDCW	
A2C3	0160-0373	C:FXD CER 1.6PF +/-0.1PF 600VDCW	
A2C4	0121-0059	C:VAR CER. DISK 2PF TO 8 PF 300 VDCW NPO	
A2C5	0140-0069	C:FXD MICA 550 PF 10% 500 VDCW	
A2C6	0121-0059	C:VAR CER. DISK 2PF TO 8 PF 300 VDCW NPO	
A2C7	0140-0069	C:FXD MICA 550 PF 10% 500 VDCW	
A2C8	0140-0069	C:FXD MICA 550 PF 10% 500 VDCW	
A2C9	0121-0059	C:VAR CER. DISK 2PF TO 8 PF 300 VDCW NPO	
A2C10	0140-0069	C:FXD MICA 550 PF 10% 500 VDCW	
A2CR1	0122-0009	C:VOLTAGE VARIABLE (PAIR)	
A2CR2	0122-0009	C:VOLTAGE VARIABLE (PAIR)	
A2Q1	1850-0152	TRANSISTOR:GERMANIUM PNP	

≠ See list of abbreviations in introduction to this section

Table 6-17. 2nd UHF Mixer Module A22 (05100-6013) Cont'd.
(Prefix all parts in this table A22)

Reference Designation	Stock No.	Description #	Note
A2Q2	1850-0152	TRANSISTOR:GERMANIUM PNP	
A2R1	0758-0009	R:FXD MET FLM 6800 OHM 5% 1/2W	
A2R2	0758-0003	R:FXD MET FLM 1000 OHM 5% 1/2W	
A2R3	0757-0296	R:FXD MET FLM 200 OHM 2% 1/2W	
A2R4	0758-0003	R:FXD MET FLM 1000 OHM 5% 1/2W	
A2T1	05100-8004	TRANSFORMER- PUMP INPUT	
A2T2	05100-8007	TRANSFORMER-MIXER OUT	
A2T3	05100-8008	TRANSFORMER-AMP. OUTPUT	
A2T4	05100-8009	TRANSFORMER-FINAL OUTPUT	
C1	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C2	0150-0093	C:FXD CER 0.01UF +80-20% 100VDCW	
C3	0140-0190	C:FXD MICA 39 PF 5% 300 VDCW	
C4	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C5	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C6	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C7	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C8	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C9	0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
J1	1250-0083	CONNECTOR:BNC	
J2	1250-0083	CONNECTOR:BNC	
J3	1250-0083	CONNECTOR:BNC	
L1	9140-0018	COIL:FXD 1UH	
L2	9140-0018	COIL:FXD 1UH	
L3	9140-0018	COIL:FXD 1UH	
		MISCELLANEOUS	
	05100-0003	BRACKET	
	05100-0004	COVER	
	05100-0021	FRAME	
	05100-2056	PLATE-END	
	0340-0039	INSULATOR:BUSHING	
	0340-0038	TERMINAL:STUD	

See list of abbreviations in introduction to this section

Table 6-18. 3rd UHF Mixer Module A23 (05100-6014)
(Prefix all parts in this table A23)

Reference Designation	Stock No.	Description #	Note
A1	05100-6043 05100-2017 1400-0117	BOARD ASSY.- UHF BLANK BOARD CLIP:MOUNTING	
A1C1	0140-0214	C:FXD MICA 60PF 5% 300VDCW	
A1C2	0150-0058	C:FXD CER 2.2 PF +/- NPO 600 VDCW	
A1C3	0150-0059	C:FXD CER 3.3 PF +/- NPO 600 VDCW	
A1C4	0150-0058	C:FXD CER 2.2 PF +/- NPO 600 VDCW	
A1CR1	1900-0011	SEMICON DEVICE:DIODE 1N4168M MATCH PAIR	
A1CR2	1900-0011	SEMICON DEVICE:DIODE 1N4168M MATCH PAIR	
A1DL1	05100-6102	CABLE ASSY.- DELAY LINE	
A1L1	05100-8018	COIL- FILTER .115UH	
A1L2	9140-0120	COIL:FXD 0.1 UH	
A1R1	0757-0294	R:FXD MET FLM 17.8 OHM 1% 1/8W	
A1R2	0757-0297	R:FXD MET OX 300 OHM 2% 1/2W	
A1R3	0757-0297	R:FXD MET OX 300 OHM 2% 1/2W	
A1R4	0757-0295	R:FXD MET FLM 11.5 OHM 1% 1/8W	
A1R5	0757-0074	R:FXD MET OX 430 OHM 2% 1/2W	
A1R6	0757-0074	R:FXD MET OX 430 OHM 2% 1/2W	
A2	05100-6165 05100-2057	BOARD ASSY.- FILTER BLANK-BOARD	
A2C1	0160-0178	C:FXD MICA 27PF 5%	
A2C2	0140-0034	C:FXD MICA 22 PF 5% 500 VDCW	
A2C3	0150-0058	C:FXD CER 2.2 PF +/- NPO 600 VDCW	
A2L1	9140-0018	COIL:FXD 1UH	
A2L2	9140-0018	COIL:FXD 1UH	
A2L3	9140-0024	COIL:FXD 0.68 UH	
A2L4	9140-0024	COIL:FXD 0.68 UH	
J1	1250-0083	CONNECTOR:BNC	
J2	1250-0083	CONNECTOR:BNC	
J3	1250-0118	CONNECTOR:BNC	
L1	9140-0088	INDUCTOR:RF 0.33UH 5%	
L2	9140-0088	INDUCTOR:RF 0.33UH 5%	
		MISCELLANEOUS	
	1400-0109	CLIP:MOUNTING	
	05100-0011	COVER	
	05100-0013	FRAME	
	05100-2055	PLATE-RIGHT END	
	05100-2026	PLATE- RIGHT END	
	3040-0037	PIN:DRIVE RH SST 3/16	
	05100-0068	SHIELD-FILTER	

See list of abbreviations in introduction to this section

Table 6-19. Output Amplifier Module A24 (05100-6015)
(Prefix all parts in this table A24)

Reference Designation	Stock No.	Description #	Note
A1	05100-6044 05100-2018	BOARD ASSY.- OUTPUT AMPLIFIER BLANK BOARD	
A1C1	0140-0204	C:FXD MICA 47PF 5% NPO 500VDCW	
A1C2	0180-0137	C:FXD ELECT TA 100 UF 20% 10VDCW	
A1C3	0180-0010	C:FXD ELECT 8UF -15%+20% 30VDCW	
A1C4	0180-0155	C:FXD TA 2.2UF 20% 20VDCW NOT RECOMMENDED FOR FIELD REPLACEMENT	
A1C5	0150-0121	C:FXD CER 0.1UF 50 VDCW	
A1C6	0150-0121	C:FXD CER 0.1UF 50 VDCW	
A1C7	0180-0033	C:FXD ELECT 50UF 6VDCW	
A1C8	0180-0159	C:FXD ELECT 220UF 10VDCW	
A1C9	0150-0121	C:FXD CER 0.1UF 50 VDCW	
A1C10	0180-0058	C:FXD ELECT 50UF -10%+100% 25VDCW	
A1C11	0180-0039	C:FXD ELECT 100UF 12VDCW	
A1C12	0180-0058	C:FXD ELECT 50UF -10%+100% 25VDCW	
A1C13	0150-0121	C:FXD CER 0.1UF 50 VDCW	
A1C14	0150-0121	C:FXD CER 0.1UF 50 VDCW	
A1C15 THRU		NOT ASSIGNED	
A1C20			
A1C21	0180-0159	C:FXD ELECT 220UF 10VDCW	
A1C22	0180-0045	C:FXD ELECT 20UF 25VDCW	
A1C23	0150-0121	C:FXD CER 0.1UF 50 VDCW	
A1C24	0150-0121	C:FXD CER 0.1UF 50 VDCW	
A1C25	0180-0039	C:FXD ELECT 100UF 12VDCW	
A1C26	0180-0061	C:FXD ELECT 100UF +100%-10% 15VDCW	
A1C27	0150-0121	C:FXD CER 0.1UF 50 VDCW	
A1C28	0150-0121	C:FXD CER 0.1UF 50 VDCW	
A1C29	0150-0121	C:FXD CER 0.1UF 50 VDCW	
A1C30	0160-0127	C:FXD CER 1UF 20% 25VDCW	
A1C31	0160-0127	C:FXD CER 1UF 20% 25VDCW	
A1C32	0180-0098	C:FXD ELECT 100UF 20% 20VDCW	
A1C33	0150-0121	C:FXD CER 0.1UF 50 VDCW	
A1C34 THRU		NOT ASSIGNED	
A1C40			
A1C41	0150-0070	C:FXD CER .02UF 20% 500VDCW	
A1C42	0140-0159	C:FXD MICA 3000PF 300VDCW	
A1C43	0140-0159	C:FXD MICA 3000PF 300VDCW	
A1C44	0150-0070	C:FXD CER .02UF 20% 500VDCW	
A1C45	0160-0174	C:FXD CER 0.47UF +80-20% 25VDCW	
A1CR1	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1CR2	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1CR3	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR4	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR5	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR6	1901-0040	SEMICON DEVICE:DIODE SILICON	
A1CR7	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR8	1901-0040	SEMICON DEVICE:DIODE SILICON	
A1CR9	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1L1	05100-6183	COIL ASSY.- VARIABLE	
A1L2	9140-0137	COIL:FXD RF 100 UH	

= See list of abbreviations in introduction to this section

Table 6-19. Output Amplifier Module A24 (05100-6015) Cont'd.
(Prefix all parts in this table A24)

Reference Designation	Stock No.	Description #	Note
A1L3	9140-0137	COIL:FXD RF 100 UH	
A1L4	9140-0096	COIL:FXD RF 1 UH	
A1L5	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L6	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L7	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L8	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1Q1	1854-0019	TRANSISTOR:SILICON NPN	
A1Q2	1854-0019	TRANSISTOR:SILICON NPN	
A1Q3	1854-0019	TRANSISTOR:SILICON NPN	
A1Q4	1854-0019	TRANSISTOR:SILICON NPN	
	1205-0012	HEAT DISSIPATOR:SEMICONDUCTOR	
A1Q5	1854-0019	TRANSISTOR:SILICON NPN	
	1205-0012	HEAT DISSIPATOR:SEMICONDUCTOR	
A1Q6	1854-0019	TRANSISTOR:SILICON NPN	
	1205-0012	HEAT DISSIPATOR:SEMICONDUCTOR	
A1Q7	1851-0017	TRANSISTOR:2N1304	
A1Q8	1854-0003	TRANSISTOR:NPN SILICON	
A1Q9	1854-0003	TRANSISTOR:NPN SILICON	
A1Q10	1853-0001	TRANSISTOR:PNP SILICON 30V 900MW	
A1Q11	1853-0001	TRANSISTOR:PNP SILICON 30V 900MW	
A1R1	2100-0806	R:VAR WW 5K OHM 5%	
A1R2	0757-0344	R:FXD MET FLM 1.00MEGOHM 1% 1/4W	
A1R3	0758-0006	R:FXD MET FLM 10K OHM 5% 1/2W	
A1R4	0758-0015	R:FXD MET FLM 220 OHM 5% 1/2W	
A1R5	0758-0003	R:FXD MET FLM 1000 OHM 5% 1/2W	
A1R6	0727-0012	R:FXD DEPC 20 OHM 1% 1/2W	
A1R7	2100-0108	R:VAR COMP LIN 100 OHM 10% 1/3W	
A1R8	0758-0010	R:FXD MET OX FLM 3300 OHM 5% 1/2W	
A1R9	0758-0015	R:FXD MET FLM 220 OHM 5% 1/2W	
A1R10	0758-0010	R:FXD MET OX FLM 3300 OHM 5% 1/2W	
A1R11	0758-0028	R:FXD MET FLM 270 OHM 5% 1/2W	
A1R12	0727-0012	R:FXD DEPC 20 OHM 1% 1/2W	
A1R13	0758-0003	R:FXD MET FLM 1000 OHM 5% 1/2W	
A1R14	0758-0015	R:FXD MET FLM 220 OHM 5% 1/2W	
A1R15	0758-0009	R:FXD MET FLM 6800 OHM 5% 1/2W	
A1R16	0758-0044	R:FXD MET OX FLM 2200 OHM 5% 1/2W	
A1R17	THRU	NOT ASSIGNED	
A1R20			
A1R21		R:FXD MET FLM 560 OHM 5% 1/2W	
A1R22		R:FXD MET FLM 150 OHM 5% 1/2W	
A1R23	0758-0045	R:FXD MET FLM 3900 OHM 5% 1/2W	
A1R24	0758-0003	R:FXD MET FLM 1000 OHM 5% 1/2W	
A1R25	0758-0028	R:FXD MET FLM 270 OHM 5% 1/2W	
A1R26	0758-0094	R:FXD MET OX 62 OHM 5% 1/2W	
A1R27	0758-0028	R:FXD MET FLM 270 OHM 5% 1/2W	
A1R28	0758-0028	R:FXD MET FLM 270 OHM 5% 1/2W	
A1R29	0758-0083	R:FXD MET OX 68 OHM 5% 1/2W	
A1R30	0758-0083	R:FXD MET OX 68 OHM 5% 1/2W	
A1R31	0727-0189	R:FXD DEPC 41.7K OHM 1% 1/2W	
A1R32	0727-0189	R:FXD DEPC 41.7K OHM 1% 1/2W	

See list of abbreviations in introduction to this section

Table 6-19. Output Amplifier Module A24 (05100-6015) Cont'd.
(Prefix all parts in this table A24)

Reference Designation	Stock No.	Description #	Note
A1R33 THRU A1R40 A1R41 A1R42 A1R43 A1R44	0758-0057 0758-0057 0758-0057 0758-0003	NOT ASSIGNED R:FXD MET FLM 5600 OHM 5% 1/2W R:FXD MET FLM 5600 OHM 5% 1/2W R:FXD MET FLM 5600 OHM 5% 1/2W R:FXD MET FLM 1000 OHM 5% 1/2W	
A1R45 A1R46 A1R47 A1R48 A1R49	0758-0054 0758-0003 0758-0003 0758-0053 0758-0071	R:FXD MET FLM 330 OHM 5% 1/2W R:FXD MET FLM 1000 OHM 5% 1/2W R:FXD MET FLM 1000 OHM 5% 1/2W R:FXD MET FLM 100K OHM 5% 1/2W R:FXD MET FLM 4300 OHM 5% 1/2W	
A1R50 A1R51 A1R52 A1R53 A1R54	0758-0002 0758-0018 0758-0071 0758-0002 0758-0053	R:FXD MET FLM 560 OHM 5% 1/2W R:FXD MET FLM 15K OHM 5% 1/2W R:FXD MET FLM 4300 OHM 5% 1/2W R:FXD MET FLM 560 OHM 5% 1/2W R:FXD MET FLM 100K OHM 5% 1/2W	
A1R55 A1R56 A1R57 A1R58 A1R59	0758-0003 2100-0806 0758-0002 0758-0017 0758-0002	R:FXD MET FLM 1000 OHM 5% 1/2W R:VAR WW 5K OHM 5% R:FXD MET FLM 560 OHM 5% 1/2W R:FXD MET FLM 1500 OHM 5% 1/2W R:FXD MET FLM 560 OHM 5% 1/2W	
A1R60 A1R61	0758-0057 2100-0806	R:FXD MET FLM 5600 OHM 5% 1/2W R:VAR WW 5K OHM 5%	
C1 C2 C3 C4 C5	0160-0345 0160-0345 0160-0345 0160-0345 0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
C6 C7 C8	0160-0345 0160-0345 0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	
J1 J2 J3	1250-0118 1250-0083 1250-0083	CONNECTOR:BNC CONNECTOR:BNC CONNECTOR:BNC	
MISCELLANEOUS			
	05100-0022 05100-0015 0340-0039 05100-2027 05100-2028	COVER- AMPLIFIER FRAME- AMPLIFIER INSULATOR:BUSHING PLATE- END: AMPLIFIER PLATE- END	
	0340-0038	TERMINAL:STUD	

= See list of abbreviations in introduction to this section

Table 6-20. Power Supply Module A25 (05100-6007)
(Prefix all parts in this table A25)

Reference Designation	Stock No.	Description #	Note
A1	05100-6031 05100-2009 1400-0010	BOARD ASSY.- RECTIFIER BLANK BOARD CLIP:ELECTRICAL PH BRZ NP 13/32X3/8X1/2	
A1C1	0180-0205	C:FXD ALUM. 12 UF -10 +75% 150VDCW	
A1C2	0180-0205	C:FXD ALUM. 12 UF -10 +75% 150VDCW	
A1CR1	1901-0049	SEMICON DEVICE:DIODE SILICON	
A1CR2	1901-0049	SEMICON DEVICE:DIODE SILICON	
A1CR3	1901-0049	SEMICON DEVICE:DIODE SILICON	
A1CR4	1901-0049	SEMICON DEVICE:DIODE SILICON	
A1CR5	1901-0026	SEMICON DEVICE:DIODE SILICON 200PIV	
A1CR6	1901-0026	SEMICON DEVICE:DIODE SILICON 200PIV	
A1CR7	1901-0026	SEMICON DEVICE:DIODE SILICON 200PIV	
A1CR8	1901-0026	SEMICON DEVICE:DIODE SILICON 200PIV	
A1CR9	1901-0049	SEMICON DEVICE:DIODE SILICON	
A1CR10	1901-0049	SEMICON DEVICE:DIODE SILICON	
A1CR11	1901-0049	SEMICON DEVICE:DIODE SILICON	
A1CR12	1901-0049	SEMICON DEVICE:DIODE SILICON	
A1CR13	1902-0060	SEMICON DEVICE:DIODE SILICON	
A1CR14	1902-0061	SEMICON DEVICE:DIODE SILICON	
A1CR15	1902-0058	SEMICON DEVICE:DIODE SILICON	
A1CR16	1902-0059	SEMICON DEVICE:DIODE SILICON	
A1CR17	1901-0025	SEMICON DEVICE:DIODE JUNCTION	
A1CR18	1901-0025	SEMICON DEVICE:DIODE JUNCTION	
A1CR19	1902-0080	SEMICON DEVICE:DIODE SILICON	
A1CR20	1902-0079	SEMICON DEVICE:DIODE SILICON	
A1CR21	1901-0025	SEMICON DEVICE:DIODE JUNCTION	
A1CR22	1901-0025	SEMICON DEVICE:DIODE JUNCTION	
A1F1	2110-0033	FUSE: 0.75AMP 250V	
A1F2	2110-0033	FUSE: 0.75AMP 250V	
A1Q1	1850-0064	TRANSISTOR:GERMANIUM 2N1183 PNP	
A1R1	0757-0290	R:FXD MET FLM 6.19K OHM 1% 1/8W	
A1R2	0757-0290	R:FXD MET FLM 6.19K OHM 1% 1/8W	
A1R3	0757-0289	R:FXD MET FLM 13.3K OHM 1% 1/8W	
A1R4	0757-0289	R:FXD MET FLM 13.3K OHM 1% 1/8W	
A1R5	0757-0290	R:FXD MET FLM 6.19K OHM 1% 1/8W	
A1R6	0757-0290	R:FXD MET FLM 6.19K OHM 1% 1/8W	
A2	05100-6032 05100-2010	BOARD ASSY.- REGULATOR BLANK BOARD	
A2C1	0180-0049	C:FXD ELECT 20UF 50VDCW	
A2C2	0180-0049	C:FXD ELECT 20UF 50VDCW	
A2CR1	1902-0769	DIODE BREAKDOWN:5.3/5.7V 400MW	
A2CR2	1902-0769	DIODE BREAKDOWN:5.3/5.7V 400MW	
A2Q1	1851-0017	TRANSISTOR:2N1304	
A2Q2	1850-0062	TRANSISTOR:GERMANIUM SPL 2N404	
A2Q3		NOT ASSIGNED	
A2Q4	1854-0003	TRANSISTOR:NPN SILICON	

See list of abbreviations in introduction to this section

Table 6-20. Power Supply Module A25 (05100-6007) Cont'd.
(Prefix all parts in this table A25)

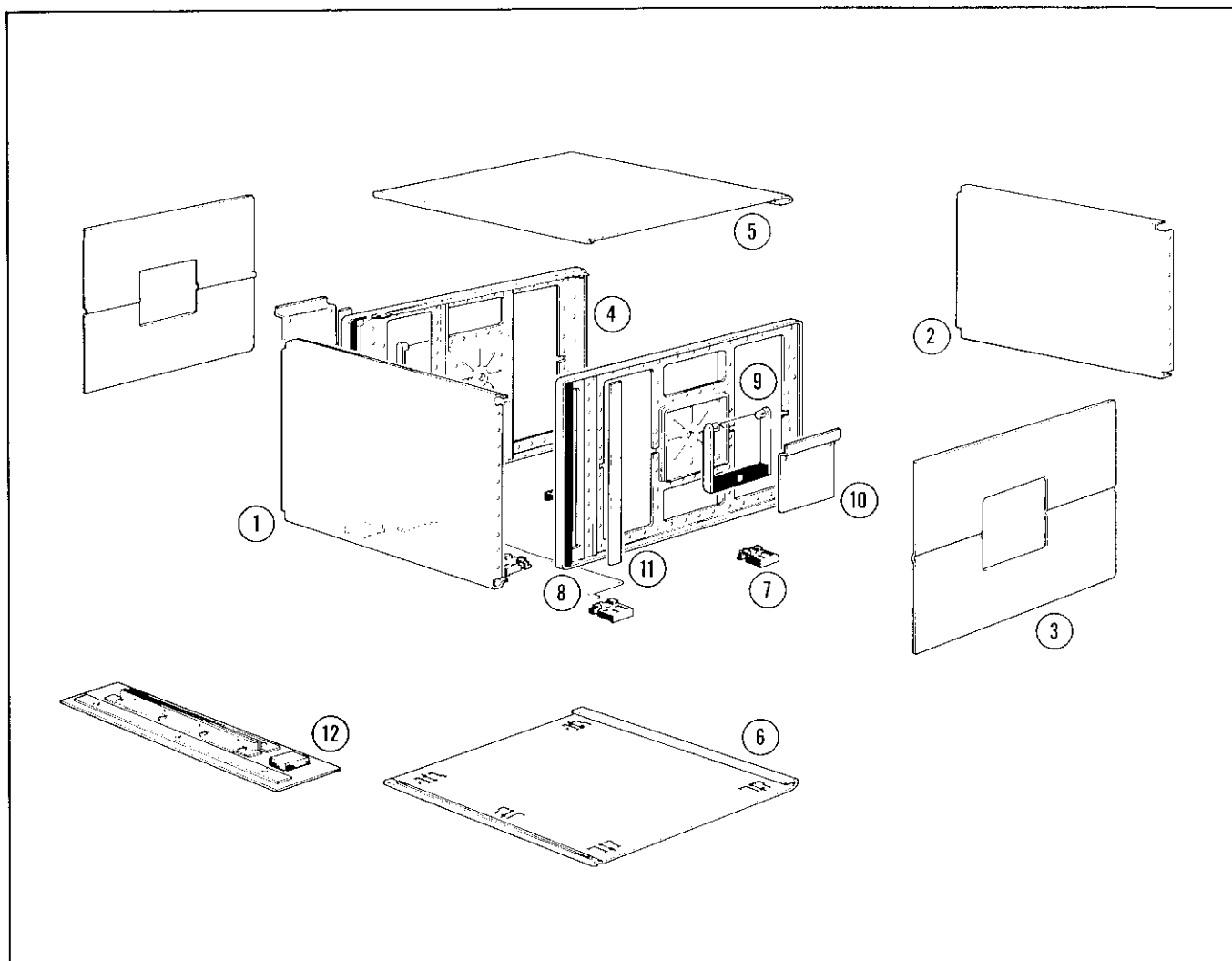
Reference Designation	Stock No.	Description #	Note
A2Q5	1853-0001	TRANSISTOR:FNP SILICON 30V 900MW	
A2Q6	1850-0062	TRANSISTOR:GERMANIUM SPL 2N404	
A2Q7	05100-6188	TRANSISTOR ASSY.- 6.3V	
A2Q8	05100-6187	TRANSISTOR ASSY.- 12.6V	
A2R1	0683-2735	R:FXD COMP 27K OHM 5% 1/4W	
A2R2	0683-4715	R:FXD COMP 470 OHM 5% 1/4W	
A2R3	0683-4715	R:FXD COMP 470 OHM 5% 1/4W	
A2R4	0683-2735	R:FXD COMP 27K OHM 5% 1/4W	
A2R5	0757-0288	R:FXD MET FLM 9.09K OHM 1% 1/8W	
A2R6	0757-0288	R:FXD MET FLM 9.09K OHM 1% 1/8W	
A2R7	0758-0003	R:FXD MET FLM 1000 OHM 5% 1/2W	
A2R8	0758-0003	R:FXD MET FLM 1000 OHM 5% 1/2W	
A2R9	0757-0086	R:FXD MET FLM 51 OHM 2% 1/2W	
A2R10	0757-0086	R:FXD MET FLM 51 OHM 2% 1/2W	
A2R11	0698-3122	R:FXD MET FLM 412 OHM 1% 1/8W	
A2R12	2100-0325	R:VAR WW 100 OHM 10% LIN 1/4W	
A2R13	0757-0287	R:FXD MET FLM 499 OHM 1% 1/2W	
A2R14	2100-0325	R:VAR WW 100 OHM 10% LIN 1/4W	
A2R15	0698-3122	R:FXD MET FLM 412 OHM 1% 1/8W	
A2R16	0758-0066	R:FXD MET FLM 620 OHM 5% 1/2W	
A2R17	0758-0066	R:FXD MET FLM 620 OHM 5% 1/2W	
A2R18	0758-0004	R:FXD MET FLM 2700 OHM 5% 1/2W	
A2R19	0758-0066	R:FXD MET FLM 620 OHM 5% 1/2W	
A2R20	0758-0066	R:FXD MET FLM 620 OHM 5% 1/2W	
A2R21	0758-0004	R:FXD MET FLM 2700 OHM 5% 1/2W	
A2R22	0758-0033	R:FXD MET FLM 2000 OHM 5% 1/2W	
A2R23	0758-0003	R:FXD MET FLM 1000 OHM 5% 1/2W	
A2R24	0683-3025	R:FXD COMP 3000 OHM 5% 1/4W	
A3	05100-6059	CAP. & COIL ASSY.	
A3C1	0180-0104	C:FXD ELECT 200UF 15VDCW	
A4	05100-6059	CAP. & COIL ASSY. INCLUDES C1 AND L1	
C1	0180-0128	C:FXD ELECT 3000UF -10+30% 30VDCW	
C2	0180-0204	C:FXD ALUM 2800 UF 40 VDCW +100 -10%	
C3	0160-0127	C:FXD CER 1UF 20% 25VDCW	
C4	0160-0127	C:FXD CER 1UF 20% 25VDCW	
P1	1251-0216	CONNECTOR:MALE 9-CONTACT TYPE D	
P2	1251-0216	CONNECTOR:MALE 9-CONTACT TYPE D	
Q1	1854-0020	TRANSISTOR:NPN SILICON	
	1200-0092	BUSHING:TRANSISTOR	
	1200-0087	CLAMP:TRANSISTOR	
	1200-0076	INSULATOR:TRANISTOR	
Q2	1851-0017	TRANSISTOR:2N1304	
	1205-0026	HEAT DISSIPATOR:BODY	
	1205-0025	NUT:HEAT DISSIPATOR	
Q3	1850-0062	TRANSISTOR:GERMANIUM SPL 2N404	
	1205-0026	HEAT DISSIPATOR:BODY	
	1205-0025	NUT:HEAT DISSIPATOR	

= See list of abbreviations in introduction to this section

Table 6-20. Power Supply Module A25 (05100-6007) Cont'd.
(Prefix all parts in this table A25)

Reference Designation	Stock No.	Description #	Note
Q4	1850-0098	TRANSISTOR GERMANIUM PNP SELECTED	
	1200-0081	BUSHING:INSULATOR NYLON	
	1200-0043	INSULATOR:TRANSISTOR ANODIZED ALUMINUM	
Q5	1854-0020	TRANSISTOR:PNP SILICON	
	1200-0087	CLAMP:TRANSISTOR	
	1200-0076	INSULATOR:TRANSISTOR	
Q6	1850-0098	TRANSISTOR:GERMANIUM PNP SELECTED	
	1200-0081	BUSHING:INSULATOR NYLON	
	1200-0043	INSULATOR:TRANSISTOR ANODIZED ALUMINUM	
R1	0812-0017	R:FXD WW 0.25 OHM 5% 3W	
R2	0812-0017	R:FXD WW 0.25 OHM 5% 3W	
T1	9100-0175	TRANSFORMER:POWER	
		MISCELLANEOUS	
	05100-0042	BRACKET-FRONT	
	05100-0044	BRACKET-SHIELD	
	05100-0045	BRACKET- TRANSFORMER	
	05100-0047	BRACKET- FRONT GUIDE	
	05100-0046	BRACKET- REAR GUIDE	
	05100-6060	CABLE ASSY.-POWER SUPPLY	
	05100-0041	COVER-POWER SUPPLY	
	05100-0043	DECK-POWER SUPPLY	
	05100-0048	COVER- BOARD	
	0340-0008	INSULATOR:STANDOFF	
	05100-2046	MTG.-CAPACITOR	
	0360-0351	TERMINAL:LUG 3-TERMINAL	

See list of abbreviations in introduction to this section



Item No.	Description	Part Number
1	Front Panel	05100-0009
2	Rear Panel	05100-0049
3	Side Cover	05100-0063
4	Frame Assembly	5060-0737
5	Top Cover	05100-6062
6	Bottom Cover	05100-6061
7	Foot Assembly	5060-0767
8	Tilt Stand	1490-0030
9	Handle Assembly	5060-0763
10	Handle Retainer	05100-0064
11	Fluted Aluminum Plate	5000-0054
12	Rack Mount Adapter Kit	5060-0778

Figure 6-1. Modular Cabinet Parts

Table 6-21. Replaceable Parts

Stock No.	Description #	Mfr.	Mfr. Part No.	TQ
0121-0059	C:VAR CER. DISK 2PF TO 8 PF 300 VDCW NPO	72982	NPO 538-006	7
0121-0061	C:VAR CER. DISK 5.5 -18 PF NPO 300 VDCW	72982	NPO 538-011	2
0122-0006	C:VAR VOLTAGE 100 PF AT -4V	28480	V100	2
0122-0009	C:VOLTAGE VARIABLE (PAIR)	28480	0122-0009	4
0130-0017	C:VAR CER 8-50 PF N750	28480	0130 0017	24
0130-0018	C:VAR CER 1.5-7 PF 500	72982	557-019-COPO-10R	6
0140-0034	C:FXD MICA 22 PF 5% 500 VDCW	76433	RCM15E220J	1
0140-0069	C:FXD MICA 550 PF 10% 500 VDCW	00853	TYPE M 100 E10	6
0140-0145	C:FXD MICA 22 PF 5% 500 VDCW	04062	DM15C220J	4
0140-0151	C:FXD MICA 820PF 2% 300VDCW	04062	DM15F821G	2
0140-0152	C:FXD MICA 1000 PF 5% 300 VDCW	04062	DM16F102J	1
0140-0159	C:FXD MICA 3000PF 300VDCW	04062	DM19F302G	2
0140-0177	C:FXD MICA 400 PF 1% 300 VDCW	04062	DM15F401F (300V)	16
0140-0178	C:FXD MICA 560 PF 2% 300 VDCW	04062	DM15F561G 300V	1
0140-0190	C:FXD MICA 39 PF 5% 300 VDCW	04062	DM15E390J 300V	2
0140-0192	C:FXD MICA 68PF 5% 300VDCW	04062	DM15E680J	7
0140-0202	C:FXD MICA 15 PF 5% 500VDCW	28480	0140-0202	2
0140-0204	C:FXD MICA 47PF 5% NPO 500VDCW	04062	DM15E470J	2
0140-0209	C:FXD MICA 5PF 10% 500VDCW	04062	DM15C050K 500V	1
0140-0214	C:FXD MICA 60PF 5% 300VDCW	04062	DM15E600J 300V	1
0140-0215	C:FXD MICA 80PF 2% 300VDCW	04062	DM15E800G 300V	6
0140-0220	C:FXD MICA 200PF 1% 300VDCW	04062	DM15F201F 300V	16
0140-0222	C:FXD MICA 240PF 1% 300VDCW	04062	DM15F241F 300V	8
0140-0225	C:FXD MICA 300PF 1% 300VDCW	04062	DM15F301F 300V	9
0140-0226	C:FXD MICA 320PF 1% 300VDCW	04062	DM15F321F 300V	16
0140-0230	C:FXD MICA 420PF 1% 300VDCW	04062	DM15F421F 300V	13
0140-0233	C:FXD MICA 480PF 1% 300VDCW	04062	DM15F481F 300V	8
0150-0042	C:FXD TI 4.7 PF 5% 500 VDCW	78488	TYPE GA	6
0150-0050	C:FXD CER 1000PF 600 VDCW	000RR	TYPE E	16
0150-0055	C:FXD TI 10 PF 5% 500 VDCW	78488	TYPE GA	1
0150-0058	C:FXD CER 2.2 PF +/- NPO 600 VDCW	72982	301 000 COJO 229C	4
0150-0059	C:FXD CER 3.3 PF +/- NPO 600 VDCW	72982	301 000 COJO 339C	1
0150-0070	C:FXD CER .02UF 20% 500VDCW	72982	821010X	2
0150-0093	C:FXD CER 0.01UF +80-20% 100VDCW	28480	0150-0093	6
0150-0111	C:FXD CER 220PF 5% 300VDCW	71590	CB T860 221J Q3M	1
0150-0121	C:FXD CER 0.1 UF 50VDCW	56289	5C50A	32
0160-0127	C:FXD CER 1 UF 20% 25VDCW	56289	5C13	4
0160-0141	C:FXD CER 1500 PF 10% 500VDCW	71590	CF-152	2
0160-0174	C:FXD CER 0.47UF +80-20% 25VDCW	56289	5C11A	1
0160-0178	C:FXD MICA 27PF 5%	28480	0160-0178	1
0160-0192	C:FXD MICA 525 PF 5%	28480	0160-0192	1
0160-0193	C:FXD MICA 1125PF 5%	28480	0160-0193	1
0160-0326	C:FXD CER 2.2PF +/-0.1PF	72982	374000 COKO 229B	32
0160-0327	C:FXD CER 3.4PF +/-0.1PF	72982	374000 COJO 349B	16
0160-0328	C:FXD CER 4.6PF +/-0.1PF	72982	374 COHO 469B	16
0160-0329	C:FXD CER 6.0PF +/-0.1PF	72982	374000 COHO 609B	8
0160-0330	C:FXD CER 6.6PF +/-0.1PF	72982	37400 COHO 669B	16
0160-0332	C:FXD MICA 133PF 1%	28480	0160-0332	16
0160-0333	C:FXD MICA 15PF +/-0.5PF	28480	0160-0333	8
0160-0334	C:FXD MICA 47PF 0.5%	28480	0160-0334	7
0160-0335	C:FXD MICA 91PF 1%	28480	0160-0335	7

See list of abbreviations in introduction to this section

Table 6-21. Replaceable Parts Cont'd.

Stock No.	Description #	Mfr.	Mfr. Part No.	TQ
0160-0336	C:FXD MICA 100PF 1%	28480	0160-0336	1
0160-0337	C:FXD MICA 160PF 1%	28480	0160-0337	16
0160-0338	C:FXD MICA 267PF 1%	28480	0160-0338	31
0160-0339	C:FXD MICA 534PF 1%	28480	0160-0339	22
0160-0340	C:FXD MICA 600PF 1%	28480	0160-0340	8
0160-0341	C:FXD MICA 640PF 1%	28480	0160-0341	16
0160-0342	C:FXD MICA 800PF 1%	28480	0160-0342	8
0160-0344	C:FXD MICA 220PF 1%	28480	0160-0344	16
0160-0345	C:FXD CER 1000PF +80-20% 500VDCW FEED-THRU	01121	FB2B-102W	38
0160-0356	C:FXD MICA 18PF 5%	28480	0160-0356	1
0160-0357	C:FXD CER 85PF 5% 500VDCW	71590	TB82850JSIG	3
0160-0358	C:FXD CER 94PF 5% 500VDCW	71590	TB82940JSIG	2
0160-0359	C:FXD CER 103PF 5% 500VDCW	71590	DA162-069J	1
0160-0360	C:FXD CER 120PF 5% 500VDCW	71590	DA163-022J	1
0160-0368	C:FXD MICA 16PF 5%	28480	0160-0368	1
0160-0369	C:FXD MICA 17PF 5%	28480	0160-0369	1
0160-0370	C:FXD MICA 20PF 5%	28480	0160-0370	1
0160-0373	C:FXD CER 1.6PF +/-0.1PF 600VDCW	72982	301-000-COKO-169B	1
0160-0374	C:FXD CER 1.8PF +/-0.1PF 500VDCW	72982	301-COK-189B	1
0160-0375	C:FXD CER 2.2PF +/-0.1PF 300VDCW	72982	301-000-COJO-229B	2
0160-2055	C:FXD CER 0.01 UF +80-20% 100VDCW	91418	TA	625
0180-0010	C:FXD ELECT 8UF -15%+20% 30VDCW	21520	PP8B30A2	1
0180-0033	C:FXD ELECT 50UF 6VDCW	56289	30D133A1	1
0180-0039	C:FXD ELECT 100UF 12VDCW	56289	30D154A1	2
0180-0045	C:FXD ELECT 20UF 25VDCW	56289	TYPE 30D	1
0180-0049	C:FXD ELECT 20UF 50VDCW	56289	30D198A1	2
0180-0058	C:FXD ELECT 50UF -10%+100% 25VDCW	56289	TYPE 30D186A1	2
0180-0061	C:FXD ELECT 100UF +100%-10% 15VDCW	56289	30D172A1	1
0180-0098	C:FXD ELECT 100UF 20% 20VDCW	56289	150D107X0020S2	1
0180-0104	C:FXD ELECT 200UF 15VDCW	56289	30D174A1	1
0180-0128	C:FXD ELECT 3000UF -10+30% 30VDCW	00853	505 1010 02	1
0180-0137	C:FXD ELECT TA 100 UF 20% 10VDCW	56289	150D107X0010R2	1
0180-0155	C:FXD TA 2.2UF 20% 20VDCW	56289	150D225X0020AZ	1
0180-0159	C:FXD ELECT 220UF 10VDCW	56289	150D227X0010S2	2
0180-0204	C:FXD ALUM 2800 UF 40 VDCW +100 -10%	05571	4S6430	1
0180-0205	C:FXD ALUM. 12 UF -10 +75% 150VDCW	05571	30D126G150DH4	2
0340-0008	INSULATOR:STANDOFF	98291	ST-1000-L2	2
0340-0036	TERMINAL:STUD	28480	0340-0036	5
0340-0037	TERMINAL:STUD	00866	HP-3000M-2	2
0340-0038	TERMINAL:STUD	28480	0340-0038	12
0340-0039	INSULATOR:BUSHING	00866	HP-3000T-1	19
0360-0351	TERMINAL:LUG 3-TERMINAL	71785	332-14-05-201	2
0360-0354	TERMINAL:STUD	71279	2267-1	5
0360-0357	TERMINAL:FEED-THRU	04013	3FU-5	2
0360-0358	TERMINAL:PRESS-IN	04013	ASO-13	33
0370-0030	KNOB:	28480	0370-0030	1
0370-0112	KNOB	28480	0370-0112	2
0380-0059	SPACER:SLEEVE BRS CP 0.250DX0.152IDX0.25	00866	0BD#	8
0510-0123	FASTENER:PUSH-ON TYPE	78553	C1200B-014-4	1
0510-0124	NUT:CAPTIVE 6-32 ST CP	83324	RPN 6-32 SC	12
0510-0210	NUT:CAPTIVE 8-32X15/32X0.263D	07886	NCN-8-3-3-12	6

See list of abbreviations in introduction to this section

Table 6-21. Replaceable Parts Cont'd.

Stock No.	Description #	Mfr.	Mfr. Part No.	TQ
0510-0212	FASTENER:HI-FREQ DECK	15291	EG-5-T-S-3-S	2
0510-0213	NUT:CAPTIVE SST 4-40	07886	NCN-4-3-4-5	6
0683-1005	R:FXD COMP 10 OHM 5% 1/4W	01121	CB 1005	1
0683-1015	R:FXD COMP 100 OHM 5% 1/4W	01121	CB 1015	7
0683-1025	R:FXD COMP 1000 OHM 5% 1/4W	01121	CB 1025	105
0683-1035	R:FXD COMP 10K OHM 5% 1/4 W	01121	CB 1035	94
0683-1225	R:FXD COMP 1200 OHM 5% 1/4W	01121	CB 1225	12
0683-1235	R:FXD COMP 12K OHM 5% 1/4W	01121	CB 1235	2
0683-1325	R:FXD COMP 1300 OHM 5% 1/4W	01121	CB 1325	6
0683-1515	R:FXD COMP 150 OHM 5% 1/4W	01121	CB 1515	1
0683-1525	R:FXD COMP 150 OHM 5% 1/4W	01121	CB 1525	86
0683-1815	R:FXD COMP 180 OHM 5% 1/4W	01121	CB 1815	6
0683-1825	R:FXD COMP 1800 OHM 5% 1/4W	01121	CB 1825	123
0683-2025	R:FXD COMP 2000 OHM 5% 1/4W	01121	CB 2025	15
0683-2215	R:FXD COMP 220 OHM 5% 1/4W	01121	CB 2215	7
0683-2225	R:FXD COMP 2.2K OHM 5% 1/4W	01121	GB 2225	40
0683-2235	R:FXD COMP 22K OHM 5% 1/4W	01121	CB 2235	11
0683-2425	R:FXD COMP 2400 OHM 5% 1/4W	01121	CB 2425	31
0683-2715	R:FXD COMP 270 OHM 5% 1/4W	01121	CB 2715	7
0683-2735	R:FXD COMP 27K OHM 5% 1/4W	01121	CB 2735	3
0683-3015	R:FXD COMP 300 OHM 5% 1/4W	01121	CB 3045	8
0683-3025	R:FXD COMP 3000 OHM 5% 1/4W	01121	CB 3025	65
0683-3315	R:FXD COMP 330 OHM 5% 1/4W	01121	CB 3315	12
0683-3325	R:FXD COMP 3300 OHM 5% 1/4W	01121	CB 3325	4
0683-3625	R:FXD COMP 3600 OHM 5% 1/4W	01121	CB 3625	22
0683-3905	R:FXD COMP 39 OHM 5% 1/4W	01121	CB 3905	8
0683-3925	R:FXD COMP 3900 OHM 5% 1/4W	01121	CB 3925	8
0683-4715	R:FXD COMP 470 OHM 5% 1/4W	01121	CB 4715	14
0683-4725	R:FXD COMP 4700 OHM 5% 1/4W	01121	CB 4725	10
0683-5105	R:FXD COMP 51 OHM 5% 1/4W	01121	CB 5105	6
0683-5115	R:FXD COMP 510 OHM 5% 1/4W	01121	CB 5115	6
0683-5625	R:FXD COMP 560 OHM 5% 1/4W	01121	CB 5625	9
0683-6215	R:FXD COMP 620 OHM 5% 1/4W	01121	CB 6215	6
0683-6805	R:FXD COMP 68 OHM 5% 1/4W	01121	CB 6805	1
0683-6825	R:FXD COMP 6800 OHM 5% 1/4W	01121	CB 6825	1
0683-7515	R:FXD COMP 750 OHM 5% 1/4W	01121	CB 7515	22
0683-8215	R:FXD COMP 820 OHM 5% 1/4W	01121	CB 8215	1
0686-3905	R:FXD COMP 39 OHM 5% 1/2W	01121	EB 3905	2
0687-3331	R:FXD COMP 33K OHM 10% 1/2W	01121	EB 3331	1
0698-3122	R:FXD MET FLM 412 OHM 1% 1/8W	28480	0698-3122	2
0721-0004	R:FXD DEPC 100K OHM 1% 1/8W	28480	0721-0004	1
0727-0012	R:FXD DEPC 20 OHM 1% 1/2W	28480	0727-0012	2
0727-0036	R:FXD DEPC 71.16 OHM 1% 1/2W	28480	0727-0036	6
0727-0109	R:FXD DEPC 1470 OHM 1% 1/2W	28480	0727-0109	1
0727-0112	R:FXD DEPC 1800 OHM 1% 1/2W	28480	0727-0112	1
0727-0115	R:FXD DEPC 2000 OHM 1% 1/2W	28480	0727-0115	1
0727-0137	R:FXD DEPC 5.18K OHM 1% 1/2W	28480	0727-0137	1
0727-0189	R:FXD DEPC 41.7K OHM 1% 1/2W	28480	0727-0189	2
0757-0074	R:FXD MET OX 430 OHM 2% 1/2W	28480	0757-0074	2
0757-0076	R:FXD MET FLM 560 OHM 2% 1/2W	07115	C 20	6

= See list of abbreviations in introduction to this section

Table 6-21. Replaceable Parts Cont'd.

hp Stock No.	Description #	Mfr.	Mfr. Part No.	TQ
0757-0079	R:FXD MET FLM 2700 OHM 2% 1/2W	07115	C 20	2
0757-0086	R:FXD MET FLM 51 OHM 2% 1/2W	07115	C 20	2
0757-0091	R:FXD MET FLM 18K OHM 2% 1/2W	07115	C 20	2
0757-0092	R:FXD MET FLM 33K OHM 2% 1/2W	07115	C 20	1
0757-0197	R:FXD MET FLM 1.5K OHM 1% 1/2W	75042	CEC T-0	1
0757-0269	R:FXD MET FLM 270 OHM 1% 1/8W	19701	CEA	1
0757-0270	R:FXD MET FLM 249K OHM 1% 1/8W	19701	CEA	1
0757-0271	R:FXD MET FLM 124K OHM 1% 1/8W	19701	CEA	1
0757-0273	R:FXD MET FLM 3.01K OHM 1% 1/8W	19701	CEA	1
0757-0274	R:FXD MET FLM 1.21K OHM 1% 1/8W	28480	0757-0274	1
0757-0275	R:FXD MET FLM 113 OHM 1% 1/8W	19701	CEA	1
0757-0277	R:FXD MET FLM 49.9 OHM 1% 1/8W	28480	0757-0277	2
0757-0279	R:FXD MET FLM 3.16K OHM 1% 1/8W	19701	CEA	1
0757-0280	R:FXD MET FLM 1000 OHM 1% 1/8W	19701	CEA	8
0757-0281	R:FXD MET FLM 2.74K OHM 1% 1/8W	19701	CEA	8
0757-0282	R:FXD MET FLM 221 OHM 1% 1/8W	19701	CEA	8
0757-0283	R:FXD MET FLM 2000 OHM 1% 1/8W	19701	CEA	8
0757-0284	R:FXD MET FLM 150 OHM 1% 1/8W	19701	CEA	23
0757-0287	R:FXD MET FLM 499 OHM 1% 1/2W	19701	MF7C-T2	1
0757-0288	R:FXD MET FLM 9.09K OHM 1% 1/8W	19701	MF6C-T0	2
0757-0289	R:FXD MET FLM 13.3K OHM 1% 1/8W	19701	MF5C-T0	2
0757-0290	R:FXD MET FLM 6.19K OHM 1% 1/8W	19701	MF5C-T0	4
0757-0294	R:FXD MET FLM 17.8 OHM 1% 1/8W	28480	0757-0294	1
0757-0295	R:FXD MET FLM 11.5 OHM 1% 1/8W	28480	0757-0295	1
0757-0296	R:FXD MET FLM 200 OHM 2% 1/2W	07115	C 20	2
0757-0297	R:FXD MET FLM 300 OHM 2% 1/2W	28480	0757-0297	2
0757-0298	R:FXD MET FLM 22K OHM 2% 1/2W	07115	C 20	6
0757-0316	R:FXD MET FLM 42.2 OHM 1% 1/8W	28480	0757-0316	1
0757-0344	R:FXD MET FLM 1.00MEG OHM 1% 1/4W	28480	0757-0344	1
0757-0368	R:FXD MET FLM 34.0 OHM 1% 1/8W	28480	0757-0368	2
0757-0377	R:FXD MET FLM 1.62K OHM 1% 1/8W	28480	0757-0377	1
0757-0398	R:FXD MET FLM 75 OHM 1% 1/8W	28480	0757-0398	1
0757-0914	R:FXD MET FLM 390 OHM 2% 1/8W	28480	0757-0914	1
0758-0002	R:FXD MET FLM 560 OHM 5% 1/2W	07115	C 20	5
0758-0003	R:FXD MET FLM 1000 OHM 5% 1/2W	07115	C 20/1K-5%-1/2W	25
0758-0004	R:FXD MET FLM 2700 OHM 5% 1/2W	07115	C 20	2
0758-0006	R:FXD MET FLM 10K OHM 5% 1/2W	07115	C 20	3
0758-0007	R:FXD MET FLM 150 OHM 5% 1/2W	07115	C 20	7
0758-0009	R:FXD MET FLM 6800 OHM 5% 1/2W	07115	C 20	3
0758-0010	R:FXD MET FLM 3300 OHM 5% 1/2W	28480	0758-0010	3
0758-0012	R:FXD MET FLM 12K OHM 5% 1/2W	07115	C 20	1
0758-0015	R:FXD MET FLM 220 OHM 5% 1/2W	07115	C 20	3
0758-0017	R:FXD MET FLM 1500 OHM 5% 1/2W	07115	C 20	9
0758-0018	R:FXD MET FLM 15K OHM 5% 1/2W	07115	C 20	1
0758-0024	R:FXD MET FLM 100 OHM 5% 1/2W	07115	C 20	1
0758-0028	R:FXD MET FLM 270 OHM 5% 1/2W	07115	C 20	4
0758-0031	R:FXD MET FLM 680 OHM 5% 1/2W	07115	C 20	1
0758-0033	R:FXD MET FLM 2000 OHM 5% 1/2W	07115	C 20	1
0758-0035	R:FXD MET FLM 3000 OHM 5% 1/2W	07115	C 20	3
0758-0036	R:FXD MET FLM 3600 OHM 5% 1/2W	07115	C 20	2
0758-0043	R:FXD MET FLM 1800 OHM 5% 1/2W	07115	C 20	1
0758-0044	R:FXD MET OX 2200 OHM 5% 1/2W	07115	C 20	1
0758-0045	R:FXD MET FLM 3900 OHM 5% 1/2W	07115	C 20	1
0758-0053	R:FXD MET FLM 100K OHM 5% 1/2W	07115	C 20	2
0758-0054	R:FXD MET FLM 330 OHM 5% 1/2W	07115	C 20	2
0758-0057	R:FXD MET FLM 5600 OHM 5% 1/2W	07115	C 20	4

See list of abbreviations in introduction to this section

Table 6-21. Replaceable Parts Cont'd.

Stock No.	Description #	Mfr.	Mfr. Part No.	TQ
0758-0066	R:FXD MET FLM 620 OHM 5% 1/2W	07115	C 20	4
0758-0071	R:FXD MET FLM 4300 OHM 5% 1/2W	07115	C 20	2
0758-0073	R:FXD MET FLM 24K OHM 5% 1/2W	07115	C 20	1
0758-0083	R:FXD MET OX 68 OHM 5% 1/2W	07115	C20	2
0758-0093	R:FXD MET OX 56 OHM 5% 1/2W	28480	0758-0093	11
0758-0094	R:FXD MET OX 62 OHM 5% 1/2W	28480	0758-0094	5
0812-0017	R:FXD WW 0.25 OHM 5% 3W	35434	VTA 3	2
0839-0029	RESISTOR:TEMPERATURE-SENSITIVE 14K OHM	17109	M709-113	6
0900-0034	GASKET:SILICONE RUBBER 1-7/16IDX1-5/8OD	28480	0900-0034	1
1120-0152	MICROAMMETER:100 MICROAMPERES	28480	1120-0152	1
1200-0043	INSULATOR:TRANSISTOR ANODIZED ALUMINUM	76530	294457	2
1200-0076	INSULATOR:TRANSISTOR	02735	DF 14A	2
1200-0081	BUSHING:INSULATOR NYLON	26365	974SPECIAL	4
1200-0087	CLAMP:TRANSISTOR	02735	DF-13-A	2
1200-0092	BUSHING:TRANSISTOR	02735	495334 1	2
1205-0012	HEAT DISSIPATOR:SEMICONDUCTOR	28480	1205-0012	3
1205-0025	NUT:HEAT DISSIPATOR	13103	1101A-1	2
1205-0026	HEAT DISSIPATOR:BODY	28480	1205-0026	2
1205-0031	HEAT SINK:TRANSISTOR	28480	1205-0031	6
1250-0066	CONNECTOR:BNC JACK	28480	1250-0066	1
1250-0083	CONNECTOR:BNC	91737	UG-1094/U	23
1250-0118	CONNECTOR:BNC	91737	8427	2
1250-0123	CONNECTOR:BNC	91737	UG-1-94/U NI RH	1
1250-0149	CONNECTOR:RF COAXIAL BNC RT-ANGLE RECEPT	91737	UG-1174/U	3
1250-0212	CONNECTOR:JACK CHASSIS BNC	91737	11656	41
1250-0214	CONNECTOR:BNC JACK	28480	1250-0214	1
1251-0143	CONNECTOR:FEMALE 14-CONTACT JACK	02660	57-40140	2
1251-0194	CONNECTOR:PRINTED CIRCUIT 15-CONTACT	95354	SD-615TS	1
1251-0216	CONNECTOR:MALE 9-CONTACT TYPE D	71468	DEM-9P	2
1251-0382	CONNECTOR:12-TERMINAL	28480	1251-0382	1
1251-0384	CONNECTOR:SUBMINAT TYPE D 9-CONTACT FEMALE	71785	DEMF-9A	2
1251-0424	CONNECTOR:MALE SINGLE BANANA	78447	1251-0424	16
1400-0010	CLIP:ELECTRICAL PH BRZ NP 13/32X3/8X1/2	71400	4550	4
1400-0084	FUSEHOLDER:EXTRACTOR POST TYPE	75915	342014	2
1400-0109	CLIP:MOUNTING	91506	7109-1C	3
1400-0117	CLIP:MOUNTING	99378	100-320-3	4
1400-0155	SPRING:RETAINING	28480	1400-0155	40
1450-0048	LAMP:NEON	08717	858-R	1
1460-0164	SPRING:HELICAL 0.25X0.30 0.0220 WIRE	91260	0BD	1
1490-0030	STAND:TILT	28480	1490 0030	1
1850-0020	TRANSISTOR:GERMANIUM 2N1143 PNP	01295	2N1143	6
1850-0062	TRANSISTOR:GERMANIUM SPL 2N404	28480	1850-0062	15
1850-0064	TRANSISTOR:GERMANIUM 2N1183 PNP	02735	2N1183	1
1850-0075	TRANSISTOR:GERMANIUM 2N779A PNP	87216	2N779A	9
1850-0091	TRANSISTOR:GERMANIUM 2N2048 PNP	87216	2N2048	28
1850-0098	TRANSISTOR GERMANIUM PNP SELECTED	28480	1850-0098	2
1850-0118	TRANSISTOR:PNP GERMANIUM EIA 2N2360	82767	2N2360	62
1850-0119	TRANSISTOR:PNP GERMANIUM EIA 2N963	04713	2N963	13
1850-0138	TRANSISTOR:PNP GERMANIUM EIA 2N2360	28480	1850-0138	7
1850-0121	TRANSISTOR:GERMANIUM PNP 2N2402	87216	2N2402	6
1850-0152	TRANSISTOR:GERMANIUM PNP	28480	1850-0152	2
1850-0153	TRANSISTOR:GERMANIUM PNP	28480	1850-0153	1
1250-0027	CONNECTOR:BNC	91737	5321	95
1250-0037	PIN(FOR BNC CONNECTOR)	91737	11960-19	95
1250-0041	CONNECTOR:NUT	91737	5321-14	95

See list of abbreviations in introduction to this section

Table 6-21. Replaceable Parts Cont'd.

Stock No.	Description #	Mfr.	Mfr. Part No.	TQ
1851-0017	TRANSISTOR:2N1304	01295	2N1304	3
1853-0001	TRANSISTOR:PNP SILICON 30V 900MW	28480	1853 0001	3
1854-0003	TRANSISTOR:NPN SILICON	28480	1854-0003	3
1854-0005	TRANSISTOR:2N708 NPN SILICON	07263	2N708	4
1854-0019	TRANSISTOR:SILICON NPN	28480	1854-0019	6
1854-0020	TRANSISTOR:NPN SILICON	28480	1854-0020	2
1900-0011	SEMICON DEVICE:DIODE 1N4168M MATCH PAIR	93332	1N4168M	2
1901-0025	SEMICON DEVICE:DIODE JUNCTION	28480	1901 0025	114
1901-0026	SEMICON DEVICE:DIODE SILICON 200PIV	28480	1901-0026	4
1901-0040	SEMICON DEVICE:DIODE SILICON	28480	1901-0040	22
1901-0049	SEMICON DEVICE:DIODE SILICON	28480	1901 0049	8
1901-0127	SEMICON DEVICE:DIODE SILICON STEP-RECOVERY	28480	1901-0127	3
1901-0128	SEMICON DEVICE:DIODE SILICON STEP-RECOVERY	28480	1901-0128	3
1902-0058	SEMICON DEVICE:DIODE SILICON	28480	1902-0058	1
1902-0059	SEMICON DEVICE:DIODE SILICON	28480	1902-0059	1
1902-0060	SEMICON DEVICE:DIODE SILICON	28480	1902-0060	1
1902-0061	SEMICON DEVICE:DIODE SILICON	28480	1902-0061	1
1902-0079	SEMICON DEVICE:DIODE SILICON	28480	1902-0079	1
1902-0080	SEMICON DEVICE:DIODE SILICON	28480	1902-0080	1
1902-0126	SEMICON DEVICE:DIODE BREAKDOWN 2.61 V	28480	1902-0126	4
1902-0769	DIODE BREAKDOWN:5.3/5.7V 400MW	28480	1902-0769	2
1910-0016	SEMICON DEVICE:DIODE GERMANIUM	93332	02361	264
1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	28480	1910-0022	32
1910-0029	SEMICON DEVICE:DIODES GERM. MATCHED PR.	93332	03177	32
1910-0030	SEMICON DEVICE:DIODE GERMANIUM	28480	1910-0030	5
2100-0024	R:VAR COMP 1000 OHM 10% LIN 2W	28480	2100-0024	1
2100-0108	R:VAR COMP LIN 100 OHM 10% 1/3W	11237	WPE70	1
2100-0277	R:VAR COMP 100 OHM 20% LIN 0.3W	28480	2100-0277	1
2100-0325	R:VAR WW 100 OHM 10% LIN 1/4W	28480	2100-L.25	2
2100-0737	R:VAR WW 200 OHM TYPE H CONFIGURATION	28480	2100-0737	1
2100-0741	R:VAR WW 5K OHM 5%	28480	2100-0741	2
2100-0755	R:VAR WW 1000 OHM 5%	28480	2100-0755	1
2100-0806	R:VAR WW 5K OHM 5%	28480	2100-0806	3
2100-0941	R:VAR WW 1000 OHM 5%	28480	2100-0941	6
2100-1429	R:VAR WW 2000 OHM 5% 1W	28480	2100-1429	1
2110-0012	FUSE:CARTRIDGE 1/2 AMP 250V	75915	312500	1
2110-0027	FUSE:CARTRIDGE 1/8 AMP 250V SLOW BLOW	75915	312.125	1
2110-0033	FUSE: 0.75AMP 250V	79515	F02GR750A	2
3040-0037	PIN:DRIVE RH SST 3/16	28480	3040-0037	6
3100-0500	SWITCH:ROTARY	28480	3100-0500	1
3100-0701	SWITCH:ROTARY	28480	3100-0701	1
3101-0033	SWITCH:SLIDE DPDT	42190	4633	1
3101-0038	SWITCH:T0G DPDT 3 AMP 125 V	04009	83054-B	3
3104-0005	SWITCH:PUSHBUTTON	28480	3104-0005	1
3104-0006	SWITCH:PUSHBUTTON	28480	3104-0006	1
3104-0007	SWITCH:PUSHBUTTON	28480	3104-0007	8
5020-0241	SUPPORT:ETCHED CIRCUIT BOARD	28480	5020-0241	2
8120-0078	CABLE POWER:7.5FT.	70903	KH4147	1
9100-0175	TRANSFORMER:POWER	28 80	9100-0175	1
9110-0054	FILTER-BANDPASS 330 MC	28480	9110-0054	1
9110-0055	FILTER-BANDPASS 350 MC	28480	9110-0055	1

See list of abbreviations in introduction to this section

Table 6-21. Replaceable Parts Cont'd.

Stock No.	Description #	Mfr.	Mfr. Part No.	TQ
9110-0056	FILTER-BANDPASS 360 MC	28480	9110-0056	2
9110-0057	FILTER-BANDPASS 370 MC	28480	9110-0057	1
9110-0058	FILTER-BANDPASS 380 MC	28480	9110-0058	1
9110-0059	FILTER-BANDPASS 390 MC	28480	9110-0059	1
9110-0060	FILTER-BANDPASS 395 MC	28480	9110-0060	1
9110-0086	FILTER:ELECTRICAL POWER LINE	28480	9110-0086	1
9140-0018	COIL:FXD 1UH	28480	9140-0018	7
9140-0024	COIL:FXD 0.68 UH	28480	9140-0024	2
9140-0080	COIL:RF. 0.18 MH 10%	95265	NB-0.18-P	2
9140-0088	INDUCTOR:RF 0.33UH 5%	95265	NB.33-P	2
9140-0094	COIL:FXD RF 0.68UH	99800	1537-08	1
9140-0095	COIL:FXD RF 0.27UH	28480	9140-0095	12
9140-0096	COIL:FXD RF 1 UH	28480	9140-0096	10
9140-0114	COIL:FXD RF 10 UH	28480	9140-0114	38
9140-0115	COIL:FXD RF 22UH 10%	99800	2150-32	6
9140-0120	COIL:FXD 0.1 UH	28480	9140 0120	5
9140-0137	COIL:FXD RF 100 UH	28480	9140-0137	2
9140-0141	COIL:FXD RF 0.68 UH	28480	9140-0141	1
9140-0159	COIL:FXD 0.47UH 20%	99800	1025-SERIES	7
9140-0176	COIL-FXD R.F. 4 UH 5%250 MA	99800	TYPE 1537	8
9140-0177	COIL-FXD R.F. 8 UH 5% 500 MA	99800	TYPE 1537	8
9140-0178	COIL-FXD R.F. 12 UH 10% 375 MA	99800	1537-38	30
9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	99800	1537-44	208
9140-0180	COIL:FXD 2.7UH 10%	99800	1537-22	1
9140-0181	COIL:FXD RF 22UH 5%	78526	12201M	8
9140-0188	COIL:FXD 0.56UH 10%	99800	1840-07	1
9170-0042	COIL:VAR 0.27-0.41UH	95265	NCF1M	1
9170-0105	CORE:ADJUSTABLE TUNING	95566	A1-464 NO WAX	101
9170-0106	CORE:ADJUSTABLE TUNING	28480	9170-0106 WAX	123
05100-0001	COVER:METER AMPLIFIER	28480	05100-0001	1
05100-0002	BRACKET	28480	05100-0002	1
05100-0003	BRACKET	28480	05100-0003	1
05100-0004	COVER	28480	05100-0004	1
05100-0005	COVER	28480	05100-0005	1
05100-0007	COVER:CONNECTOR BLOCK	28480	05100-0007	1
05100-0010	BRACKET-DECADE	28480	05100-0010	8
05100-0011	COVER	28480	05100-0011	1
05100-0012	COVER- MULTIPLIER 33/330 MC	28480	05100-0012	1
05100-0013	FRAME	28480	05100-0013	1
05100-0014	FRAME	28480	05100-0014	1
05100-0015	FRAME- AMPLIFIER	28480	05100-0015	1
05100-0018	BRACKET-END	28480	05100-0018	8
05100-0019	COVER-DECADE (#1)	28480	05100-0019	1
05100-0020	SHIELD	28480	05100-0020	10
05100-0021	FRAME	28480	05100-0021	1
05100-0022	COVER- AMPLIFIER	28480	05100-0022	1
05100-0023	BAR-LOCKING	28480	05100-0023	1
05100-0025	BRACKET-CABLE	28480	05100-0025	1
05100-0026	BRACKET-SEARCH OSC.	28480	05100-0026	1
05100-0027	COVER-SEARCH OSC.	28480	05100-0027	1

= See list of abbreviations in introduction to this section

Table 6-21. Replaceable Parts Cont'd.

Stock No.	Description #	Mfr.	Mfr. Part No.	TQ
05100-0041	COVER-PWR. SUPPLY	28480	05100-0041	1
05100-0042	BRACKET-FRONT	28480	05100-0042	1
05100-0043	DECK-POWER SUPPLY	28480	05100-0043	1
05100-0044	BRACKET-SHIELD	28480	05100-0044	1
05100-0045	BRACKET- TRANSFORMER	28480	05100-0045	1
05100-0046	BRACKET- REAR GUIDE	28480	05100-0046	1
05100-0047	BRACKET- FRONT GUIDE	28480	05100-0047	1
05100-0048	COVER- BOARD	28480	05100-0048	1
05100-0058	GASKET TOP(3-4 MC SWITCH)	28480	05100-0058	1
05100-0059	GASKET BOTTOM(3-4 MC SWITCH)	28480	05100-0059	1
05100-0060	GASKET-TOP COVER(30-39 MC SWITCH)	28480	05100-0060	1
05100-0067	GUARD-SWITCH	28480	05100-0067	1
05100-0068	SHIELD-FILTER	28480	05100-0068	1
05100-0070	PLATE-SEARCH OSC.	28480	05100-0070	1
05100-0073	COVER-DECADE	28480	05100-0073	7
05100-0080	COVER- MULTIPLIER 35/350	28480	05100-0080	1
05100-0081	COVER- MULTIPLIER 36/360 MC	28480	05100-0081	1
05100-0082	COVER- MULTIPLIER 37/370 MC	28480	05100-0082	1
05100-0083	COVER- MULTIPLIER 38/380 MC	28480	05100-0083	1
05100-0084	COVER- MULTIPLIER 39/390 MC	28480	05100-0084	1
05100-2001	BLANK BOARD	28480	05100-2001	8
05100-2002	BLANK BOARD	28480	05100-2002	7
05100-2003	BLANK BOARD	28480	05100-2003	2
05100-2004	BOARD:METER AMP.	28480	05100-2004	1
05100-2005	BOARD- 24MC AMP.	28480	05100-2005	1
05100-2006	BLANK BOARD-OSCILLATOR	28480	05100-2006	1
05100-2007	BLANK BOARD-OUTPUT	28480	05100-2007	1
05100-2008	BLANK BOARD	28480	05100-2008	1
05100-2009	BLANK BOARD	28480	05100-2009	1
05100-2010	BLANK BOARD	28480	05100-2010	1
05100-2011	BLANK BOARD- SWITCH	28480	05100-2011	10
05100-2012	BLANK BOARD-OUTPUT	28480	05100-2012	1
05100-2013	BOARD-BLANK	28480	05100-2013	1
05100-2014	BLANK BOARD	28480	05100-2014	1
05100-2015	BLANK BOARD	28480	05100-2015	1
05100-2016	BLANK BOARD	28480	05100-2016	1
05100-2017	BLANK BOARD	28480	05100-2017	1
05100-2018	BLANK BOARD	28480	05100-2018	1
05100-2019	BOARD- MULTIPLIER	28480	05100-2019	1
05100-2020	BLANK BOARD- MULTIPLIER	28480	05100-2020	4
05100-2021	BLANK BOARD- MULTIPLIER	28480	05100-2021	1
05100-2022	HOUSING-30/39 MC SWITCH	28480	05100-2022	1
05100-2023	COVER-SWITCH, BOTTOM	28480	05100-2023	1
05100-2024	COVER-SWITCH, TOP	28480	05100-2024	1
05100-2025	PIN- PIVOT	28480	05100-2025	2
05100-2026	PLATE- RIGHT END	28480	05100-2026	1
05100-2027	PLATE- END, AMPLIFIER	28480	05100-2027	1
05100-2028	PLATE- END	28480	05100-2028	1
05100-2029	BLOCK:DECADE CONNECTOR	28480	05100-2029	1
05100-2030	HOUSING:3-4 MC SWITCH	28480	05100-2030	1

See list of abbreviations in introduction to this section

Table 6-21. Replaceable Parts Cont'd.

Stock No.	Description #	Mfr.	Mfr. Part No.	TQ
05100-2031	HOUSING-350-390 MC SWITCH	28480	05100-2031	1
05100-2032	CONNECTOR-DECADE	28480	05100-2032	8
05100-2033	BAR-FRONT DECADE	28480	05100-2033	8
05100-2034	BAR-REAR DECADE	28480	05100-2034	8
05100-2035	BAR-SWITCH	28480	05100-2035	1
05100-2036	ROD-SWITCH LOCKING	28480	05100-2036	1
05100-2037	BAR-RETAINING	28480	05100-2037	1
05100-2038	SPACER-SWITCH	28480	05100-2038	2
05100-2039	STRIP-GROUND	28480	05100-2039	16
05100-2040	PLATE-SIDE	28480	05100-2040	1
05100-2041	COVER-350-390 MC SWITCH	28480	05100-2041	1
05100-2043	COVER:TOP	28480	05100-2043	1
05100-2044	COVER:BOTTOM	28480	05100-2044	1
05100-2045	BRACKET- REAR	28480	05100-2045	1
05100-2046	MTG.-CAPACITOR	28480	05100-2046	1
05100-2047	BOARD-ETCHED CKT.	28480	05100-2047	1
05100-2048	BAR- MTG.	28480	05100-2048	1
05100-2049	SUPPORT- SWITCH	28480	05100-2049	1
05100-2053	PIN-GUIDE	28480	05100-2053	2
05100-2055	PLATE-RIGHT END	28480	05100-2055	1
05100-2056	PLATE-END	28480	05100-2056	4
05100-2057	BLANK-BOARD	28480	05100-2057	1
05100-2061	BUSHING- LATCH	28480	05100-2061	2
05100-2063	LATCH- DECK	28480	05100-2063	1
05100-2065	BRACKET-SWITCH	28480	05100-2065	1
05100-4010	CLAMP- FILTER	28480	05100-4010	16
05100-6001	MIXER/DIVIDER MODULE 3.0-3.1 MC	28480	05100-6001	7
05100-6002	FILTER ASSY. 30-31 MC MIXER	28480	05100-6002	1
05100-6003	ASSY.- PUSHBUTTON SWITCH	28480	05100-6003	1
05100-6004	CONNECTOR BLOCK MODULE	28480	05100-6004	1
05100-6005	SEARCH OSCILLATOR MODULE	28480	05100-6005	1
05100-6006	3-4 MC SWITCH MODULE	28480	05100-6006	1
05100-6007	POWER SUPPLY MODULE	28480	05100-6007	1
05100-6010	30 TO 39 MC SWITCH MODULE	28480	05100-6010	1
05100-6011	350 TO 390 MC SWITCH MODULE	28480	05100-6011	1
05100-6012	1st UHF MIXER MODULE	28480	05100-6012	1
05100-6013	2nd UHF MIXER MODULE	28480	05100-6013	1
05100-6014	3rd UHF MIXER MODULE	28480	05100-6014	1
05100-6015	OUTPUT AMPLIFIER MODULE	28480	05100-6015	1
05100-6016	39 TO 390 MC MULTIPLIER MODULE	28480	05100-6016	1
05100-6017	38 TO 380 MC MULTIPLIER MODULE	28480	05100-6017	1
05100-6018	37 TO 370 MC MULTIPLIER MODULE	28480	05100-6018	1
05100-6019	36 TO 360 MC MULTIPLIER MODULE	28480	05100-6019	1
05100-6020	35 TO 350 MC MULTIPLIER MODULE	28480	05100-6020	1
05100-6021	33 TO 330 MC MULTIPLIER MODULE	28480	05100-6021	1
05100-6023	ASSY.-DECADE MIXER BD.	28480	05100-6023	9
05100-6024	BOARD ASSY.-DECADE DIVIDER	28480	05100-6024	7
05100-6025	BOARD ASSEMBLY-EMITTER FOLLOWER	28480	05100-6025	2
05100-6026	BOARD ASSEMBLY-METER AMPLIFIER	28480	05100-6026	1
05100-6027	BOARD ASSEMBLY-24MC AMPLIFIER	28480	05100-6027	1

* See list of abbreviations in introduction to this section

Table 6-21. Replaceable Parts Cont'd.

Stock No.	Description #	Mfr.	Mfr. Part No.	TQ
05100-6028	OSCILLATOR-BOARD ASSY.	28480	05100-6028	1
05100-6029	OUTPUT BOARD ASSY.	28480	05100-6029	1
05100-6030	ASSY.- 3-4 MC SWITCH BD.	28480	05100-6030	11
05100-6031	BOARD ASSY.- RECTIFIER	28480	05100-6031	1
05100-6032	BOARD ASSY.- REGULATOR	28480	05100-6032	1
05100-6033	BOARD ASSY.-SWITCH	28480	05100-6033	10
05100-6034	OUTPUT BOARD- 30/39 MC SWITCH	28480	05100-6034	1
05100-6036	BOARD ASSY.- 38/380 MC	28480	05100-6036	1
05100-6037	BOARD ASSY.- 36/360 MC MULTIPLIER	28480	05100-6037	1
05100-6038	BOARD ASSY.- 33/330 MC	28480	05100-6038	1
05100-6039	BOARD ASSY.- MIXER	28480	05100-6039	1
05100-6040	BOARD ASSY.- FILTER	28480	05100-6040	1
05100-6041	BOARD ASSY.- UHF, 2ND MIXER	28480	05100-6041	1
05100-6042	BOARD ASSY.- FILTER, 2ND MIXER	28480	05100-6042	1
05100-6043	BOARD ASSY.- UHF	28480	05100-6043	1
05100-6044	BOARD ASSY.- OUTPUT AMPLIFIER	28480	05100-6044	1
05100-6047	ASSY.-DECADE FILTER BD.	28480	05100-6047	2
05100-6051	CABLE ASSY.-3-4MC	28480	05100-6051	1
05100-6052	CABLE ASSY.&HI-FREQ.	28480	05100-6052	1
05100-6053	ASSY.-CABLE 3-4(1)	28480	05100-6053	1
05100-6054	ASSY.-CABLE 3-4(2)	28480	05100-6054	1
05100-6055	CABLE ASSY.-REMOTE	28480	05100-6055	1
05100-6059	CAP. & COIL ASSY.	28480	05100-6059	2
05100-6060	CABLE ASSY.-POWER SUPPLY	28480	05100-6060	2
05100-6061	COVER ASSY.- BOTTOM	28480	05100-6061	1
05100-6062	COVER ASSY.- TOP	28480	05100-6062	1
05100-6063	STRAP- GROUND	28480	05100-6063	1
05100-6065	CABLE ASSY.- OUTPUT INCLUDES J4	28480	05100-6065	1
05100-6066	ASSY.- OUTPUT JUMPER CABLE	28480	05100-6066	1
05100-6067	ASSY.- HI-LEVEL OUT CABLE	28480	05100-6067	1
05100-6068	ASSY.- LO-LEVEL OUT CABLE	28480	05100-6068	1
05100-6069	ASSY.-CABLE 30 MC OUT	28480	05100-6069	1
05100-6070	ASSY.-CABLE 30 MC CONNECT	28480	05100-6070	8
05100-6071	ASSY.-CABLE BUSS FREQ.	28480	05100-6071	8
05100-6072	ASSY.-CABLE 3 MC OUT	28480	05100-6072	7
05100-6073	ASSY.-CABLE 12.6V	28480	05100-6073	8
05100-6074	ASSY.-CABLE 6.3V	28480	05100-6074	8
05100-6076	ASSY.-CABLE 3 MC & 24 MC	28480	05100-6076	16
05100-6078	ASSY.-CLAMP	28480	05100-6078	23
05100-6100	CABLE- MIXER #3 INPUT	28480	05100-6100	1
05100-6102	CABLE ASSY.- DELAY LINE	28480	05100-6102	1
05100-6103	CABLE ASSY.-30 MC OUTPUT	28480	05100-6103	1
05100-6104	CABLE- TRANSFER #1 (A)	28480	05100-6104	1
05100-6105	CABLE- TRANSFER #2 (B)	28480	05100-6105	1
05100-6106	CABLE- TRANSFER #3 (C)	28480	05100-6106	1
05100-6107	CABLE- TRANSFER #4 (D)	28480	05100-6107	1
05100-6108	CABLE- TRANSFER #5 (E)	28480	05100-6108	1
05100-6109	CABLE- TRANSFER #6 (F)	28480	05100-6109	1
05100-6110	CABLE-TRANSFER #7 (G)	28480	05100-6110	1

See list of abbreviations in introduction to this section

Table 6-21. Replaceable Parts Cont'd.

Stock No.	Description #	Mfr.	Mfr. Part No.	TQ
05100-6111	CABLE- TRANSFER #8 (H)	28480	05100-6111	1
05100-6112	CABLE ASSY.- +6.3V CONNECT	28480	05100-6112	8
05100-6113	CABLE ASSY.- INTERCONNECT	28480	05100-6113	7
05100-6114	CABLE ASSY.- 12.6V CONNECT	28480	05100-6114	8
05100-6115	CABLE ASSY.-24MC CONNECT	28480	05100-6115	5
05100-6116	CABLE ASSY.-24 MC BUSS	28480	05100-6116	3
05100-6117	ASSY.- 24 MC INPUT CABLE	28480	05100-6117	1
05100-6118	ASSY.- 3 MC INPUT CABLE	28480	05100-6118	1
05100-6119	CABLE- 33MC MULTIPLIER INPUT (A)	28480	05100-6119	1
05100-6120	CABLE- 35MC MULTIPLIER INPUT (B)	28480	05100-6120	1
05100-6121	CABLE- 36MC MULTIPLIER INPUT (C)	28480	05100-6121	1
05100-6122	CABLE- 37MC MULTIPLIER INPUT (D)	28480	05100-6122	1
05100-6123	CABLE- 38MC MULTIPLIER INPUT (E)	28480	05100-6123	1
05100-6124	CABLE- 39MC MULTIPLIER INPUT (F)	28480	05100-6124	1
05100-6125	CABLE- 330 MC OUTPUT	28480	05100-6125	1
05100-6126	CABLE- 350 MC OUTPUT (A)	28480	05100-6126	1
05100-6127	CABLE- 360 MC OUTPUT (B)	28480	05100-6127	1
05100-6128	CABLE- 370 MC OUTPUT (C)	28480	05100-6128	1
05100-6129	CABLE- 380 MC OUTPUT (D)	28480	05100-6129	1
05100-6130	CABLE- 30 MC OUTPUT (E)	28480	05100-6130	1
05100-6131	CABLE- MIXER # 2 OUTPUT	28480	05100-6131	1
05100-6132	CABLE-MIXER #3 OUTPUT	28480	05100-6132	1
05100-6133	CABLE-MIXER #1 OUTPUT	28480	05100-6133	1
05100-6134	ASSY.- SEARCH OSC. OUT CABLE	28480	05100-6134	1
05100-6159	CABLE- 390 MC OUTPUT (F)	28480	05100-6159	1
05100-6161	BOARD ASSY.- 37/370 MC	28480	05100-6161	1
05100-6162	BOARD ASSY.- 35/350 MC	28480	05100-6162	1
05100-6163	TRANSFORMER- INPUT DOUBLER	28480	05100-6163	6
05100-6164	CHASSIS ASSY.- MULTIPLIER	28480	05100-6164	6
05100-6165	BOARD ASSY.- FILTER	28480	05100-6165	1
05100-6166	COIL-VARIABLE .16-.23UH	28480	05100-6166	88
05100-6167	TRANSFORMER-VARIABLE	28480	05100-6167	7
05100-6168	COIL-VARIABLE 50-90UH	28480	05100-6168	7
05100-6169	TRANSFORMER-FIXED	28480	05100-6169	7
05100-6170	COIL-VARIABLE 3.5-5.5UH	28480	05100-6170	7
05100-6171	ASSY.-OSC. COIL 26UH	28480	05100-6171	1
05100-6172	TRANSFORMER-1.7UH	28480	05100-6172	16
05100-6174	COIL ASSY.-VARIABLE .27-.35UH	28480	05100-6174	1
05100-6175	CABLE- OSC PROGRAMMING (I)	28480	05100-6175	1
05100-6176	ASSY.- WELDING, HI FREQ. DECK	28480	05100-6176	1
05100-6177	CABLE- BUSS FREQUENCY	28480	05100-6177	1
05100-6178	CABLE ASSY. MULTIPLIER OUTPUT	28480	05100-6178	1
05100-6179	TRANSFORMER-VARIABLE	28480	05100-6179	1
05100-6180	CABLE ASSY.- DECADE TEST	28480	05100-6180	1
05100-6181	CABLE- MULTIPLIER INPUT	28480	05100-6181	1
05100-6182	COUPLER-30MC	28480	05100-6182	1
05100-6183	COIL ASSY.- VARIABLE	28480	05100-6183	1
05100-6184	CABLE ASSY.-3MC	28480	05100-6184	1
05100-6186	COIL ASSY.- VARIABLE .16-.23UH	28480	05100-6186	12
05100-6187	TRANSISTOR ASSY.- 12.6V	28480	05100-6187	1

See list of abbreviations in introduction to this section

Table 6-21. Replaceable Parts Cont'd.

Stock No.	Description #	Mfr.	Mfr. Part No.	TQ
05100-6188	TRANSISTOR ASSY.- 6.3V	28480	05100-6188	1
05100-6190	CABLE ASSY.- 3.0MC INTER-CONNECT (A)	28480	05100-6190	1
05100-6191	CABLE ASSY.- 3.1MC INTER-CONNECT (B)	28480	05100-6191	1
05100-6192	CABLE ASSY.- 3.2MC INTER-CONNECT (C)	28480	05100-6192	1
05100-6193	CABLE ASSY.- 3.3MC INTER-CONNECT (D)	28480	05100-6193	1
05100-6194	CABLE ASSY.- 3.4MC INTER-CONNECT (E)	28480	05100-6194	1
05100-6195	CABLE ASSY.- 3.5MC INTER-CONNECT (F)	28480	05100-6195	1
05100-6196	CABLE ASSY.- 3.6MC INTER-CONNECT (G)	28480	05100-6196	1
05100-6197	CABLE ASSY.- 3.7MC INTER-CONNECT (H)	28480	05100-6197	1
05100-6198	CABLE ASSY.- 3.8MC INTER-CONNECT (I)	28480	05100-6198	1
05100-6199	CABLE ASSY.- 3.9MC INTER-CONNECT (J)	28480	05100-6199	1
05100-6200	CABLE ASSY.- 30 MC INTER-CONNECT (A)	28480	05100-6200	1
05100-6201	CABLE ASSY.- 31 MC INTER-CONNECT (B)	28480	05100-6201	1
05100-6202	CABLE ASSY.- 32 MC INTER-CONNECT (C)	28480	05100-6202	1
05100-6203	CABLE ASSY.- 33 MC INTER-CONNECT (D)	28480	05100-6203	1
05100-6204	CABLE ASSY.- 34 MC INTER-CONNECT (E)	28480	05100-6204	1
05100-6205	CABLE ASSY.- 35 MC INTER-CONNECT (F)	28480	05100-6205	1
05100-6206	CABLE ASSY.- 36 MC INTER-CONNECT (G)	28480	05100-6206	1
05100-6207	CABLE ASSY.- 37 MC INTER-CONNECT (H)	28480	05100-6207	1
05100-6208	CABLE ASSY.- 38 MC INTER-CONNECT (I)	28480	05100-6208	1
05100-6209	CABLE ASSY.- 39 MC INTER-CONNECT (J)	28480	05100-6209	1
05100-6210	CABLE ASSY.- 24MC INTER-CONNECT(K)	28480	05100-6210	1
05100-6211	CABLE ASSY.- INITIAL 3MC INTERCONNECT (L)	28480	05100-6211	1
05100-6212	CABLE ASSY.- LO FREQ INTERCONNECT	28480	05100-6212	1
05100-6213	CABLE ASSY.- HI FREQ. INTERCONNECT	28480	05100-6213	1
05100-6214	COIL ASSY: 4.7 UH	28480	05100-6214	1
05100-8003	TRANSFORMER- PUMP INPUT	28480	05100-8003	1
05100-8004	TRANSFORMER- PUMP INPUT	28480	05100-8004	1
05100-8005	COIL-VARIABLE	28480	05100-8005	1
05100-8006	COIL-VARIABLE	28480	05100-8006	1
05100-8007	TRANSFORMER-MIXER OUT	28480	05100-8007	1
05100-8008	TRANSFORMER-AMP. OUTPUT	28480	05100-8008	1
05100-8009	TRANSFORMER-FINAL OUTPUT	28480	05100-8009	1
05100-8010	TRANSFORMER- MIXER OUTPUT	28480	05100-8010	1
05100-8011	TRANSFORMER- FINAL OUTPUT	28480	05100-8011	1
05100-8018	COIL- FILTER .115UH	28480	05100-8018	1

See list of abbreviations in introduction to this section

Table 6-22. Code List of Manufacturers

The following code numbers are from the Federal Supply Code for Manufacturers Cataloging Handbooks H4-1 (Name to Code) and H4-2 (Code to Name) and their latest supplements. The date of revision and the date of the supplements used appear at the bottom of each page. Alphabetical codes have been arbitrarily assigned to suppliers not appearing in the H4 handbooks.

Code No.	Manufacturer	Address	Code No.	Manufacturer	Address	Code No.	Manufacturer	Address	Code No.	Manufacturer	Address
00303	U.S.A. Common	Any supplier of U.S.	07137	Transistor Electronics Corp.	Minneapolis, Minn.	20183	General Atomics Corp.	Philadelphia, Pa.	72825	Hugh H. Eby Inc.	Philadelphia, Pa.
00136	McCoy Electronics	Mount Holly Springs, Pa.	07138	Westinghouse Electric Corp.	Westinghouse Electric Corp.	21226	Executone, Inc.	New York, N.Y.	72928	Gudeman Co.	Chicago, Ill.
00213	Sage Electronics Corp.	Rochester, N.Y.		Electronic Tube Div.	Elmira, N.Y.	21520	Fansteel Metallurgical Corp.	No. Chicago, Ill.	72964	Robert M. Hadley Co.	Los Angeles, Calif.
00334	Humalad	Colton, Calif.	07149	Filmohm Corp.	New York, N.Y.	21335	The Falair Bearing Co.	New Britain, Conn.	72982	Erie Technological Products, Inc.	Erie, Pa.
00373	Garlock Inc.	Camden, N.J.	07233	Cinch-Graphix Co.	City of Industry, Calif.	24455	G.E. Lamp Division	Nela Park, Cleveland, Ohio	73061	Hansen Mfg. Co., Inc.	Princeton, Ind.
00556	Aerovox Corp.	New Bedford, Mass.	07261	Avnet Corp.	Los Angeles, Calif.	24655	General Radio Co.	West Concord, Mass.	73076	H.M. Harper Co.	Chicago, Ill.
00779	Amp, Inc.	Harrisburg, Pa.	07263	Fairchild Camera & Inst. Corp.	Mountain View, Calif.	26385	Gros Reproductor Corp.	New Rochelle, N.Y.	73138	Helipot Div. of Beckman Inst., Inc.	Fullerton, Calif.
00781	Aircraft Radio Corp.	Bozeman, N.J.	07322	Minnesota Rubber Co.	Minneapolis, Minn.	26452	Grobet File Co. of America, Inc.	Calistad, N.J.	73293	Hughes Products Division of	Newport Beach, Calif.
00815	Northern Engineering Laboratories, Inc.	Burlington, Wis.	07387	The Birtcher Corp.	Los Angeles, Calif.	26992	Hamilton Watch Co.	Lancaster, Pa.	73445	Amperex Electronic Co., Div. of North	Hicksville, N.Y.
00853	Sangamo Electric Co.,	Pickens, S.C.	07700	Technical Wire Products Inc.	Cranford, N.J.	28480	Hewlett-Packard Co.	Palo Alto, Calif.	73506	Bradley Semiconductor Corp.	Hamden, Conn.
00866	Goe Engineering Co.	Los Angeles, Calif.	07910	Continental Device Corp.	Hawthorne, Calif.	33173	G.E. Receiving Tube Dept.	Owensboro, Ky.	73559	Carling Electric, Inc.	Hartford, Conn.
00891	Carl E. Holmes Corp.	Los Angeles, Calif.	07933	Raytheon Mfg. Co.,	Mountain View, Calif.	35434	Lectroha Inc.	Chicago, Ill.	73682	George K. Garrett Co., Div.	MSL Industries Inc.
01121	Allen Bradley Co.	Milwaukee, Wis.	07966	Shockley Semi-Conductor Laboratories	Palo Alto, Calif.	36196	Stanwex Coil Products Ltd.	Hawkesbury, Ontario, Canada	73734	Federal Screw Products Inc.	Chicago, Ill.
01255	Liton Industries, Inc.	Beverly Hills, Calif.	07980	Boatco Radio Corp.	Rockaway, N.J.	37942	P.R. Mallory & Co., Inc.	Indianapolis, Ind.	73743	Fischer Special Mfg. Co.	Cincinnati, Ohio
01281	TRW Semiconductor, Inc.	Lawndale, Calif.	08145	U.S. Engineering Co.	Los Angeles, Calif.	39543	Mechanical Industries Prod. Co.	Akron, Ohio	73793	The General Industries Co.	Elyria, Ohio
01295	Texas Instruments, Inc.	Dallas, Texas	08289	Blinn, Delbert, Co.	Pomona, Calif.	40920	Minature Precision Bearings, Inc.	Keene, N.H.	73846	Goshen Stamping & Tool Co.	Goshen, Ind.
01349	The Alliance Mfg. Co.	Alliance, Ohio	08358	Burgess Battery Co.	Niagara Falls, Ontario, Canada	42190	Muter Co.	Chicago, Ill.	73899	J.F.D. Electronics Corp.	Brooklyn, N.Y.
01589	Pacific Relays, Inc.	Van Nuys, Calif.	08564	The Bristol Co.	Waterbury, Conn.	43990	C.A. Norgren Co.	Englewood, Colo.	73905	Jennings Radio Mfg. Corp.	San Jose, Calif.
01930	Amerock Corp.	Rockford, Ill.	08717	Sloan Company	Sun Valley, Calif.	44655	Ohmite Mfg. Co.	Skokie, Ill.	74276	Signalite Inc.	Neptune, N.J.
01961	Pulse Engineering Co.	Santa Clara, Calif.	08718	ITT Cannon Electric Inc.,	Phoenix, Arizona	47904	Polard Corp.	Cambridge, Mass.	74455	J.H. Wians, and Sons	Winchester, Mass.
02114	Ferrocube Corp. of America	Saugerties, N.Y.	08792	CBS Electronics Semiconductor Operations, Div. of C.B.S., Inc.	Lowell, Mass.	48620	Precision Thermometer & Inst. Co.	Southampton, Pa.	74861	Industrial Condenser Corp.	Chicago, Ill.
02286	Cole Rubber and Plastics Inc.	Palo Alto, Calif.	08984	Met-Rain	Indianapolis, Ind.	49556	Raytheon Company	Lexington, Mass.	74868	R.F. Products Division of Ampheno-	Danbury, Conn.
02660	Amphenol-Borg Electronics Corp.	Chicago, Ill.	09026	Babcock Relays Div.	Costa Mesa, Calif.	52090	Rowan Controller Co.	Westminster, Md.	74970	E.F. Johnson Co.	Waseca, Minn.
02735	Radio Corp. of America, Semiconductor and Materials Div.	Somerville, N.J.	09134	Texas Capacitor Co.	Houston, Texas	52983	Samborn Co.	Waltham, Mass.	75042	International Resistance Co.	Philadelphia, Pa.
02771	Vocaline Co. of America, Inc.	Old Saybrook, Conn.	09145	Atom Electronics	Sun Valley, Calif.	54284	Shallcross Mfg. Co.	Selma, N.C.	75378	James Knights Co.	Sandwich, Ill.
02777	Hopkins Engineering Co.	San Fernando, Calif.	09250	Electro Assemblies, Inc.	Chicago, Ill.	55026	Simpson Electric Co.	Chicago, Ill.	75382	Kulka Electric Corporation	Brooklyn, N.Y.
03508	G.E. Semiconductor Prod. Dept.	Syracuse, N.Y.	09569	Military Battery Co. of	Canada, Ltd.	55923	Sonetone Corp.	Elmsford, N.Y.	75818	Lenz Electric Mfg. Co.	Chicago, Ill.
03705	Apex Machine & Tool Co.	Dayton, Ohio	10214	General Transistor Western Corp.	Toronto, Ontario, Canada	55938	Raytheon Co. Commercial Apparatus & Systems Div.	So. Norwalk, Conn.	75915	Littelfuse, Inc.	Des Plaines, Ill.
03797	Eldena Corp.	Compton, Calif.	10411	Tri-Tal, Inc.	Berkeley, Calif.	56137	Squidling Fibre Co., Inc.	Tonawanda, N.Y.	76005	Lord Mfg. Co.	Erie, Pa.
03877	Transiltron Electric Corp.	Wakefield, Mass.	10646	Carborandum Co.	Niagara Falls, N.Y.	56289	Sprague Electric Co.	North Adams, Mass.	76210	C.W. Mawdel	San Francisco, Calif.
03882	Pyrofilm Resistor Co., Inc.	Cedar Knolls, N.J.	11236	CTS of Berne, Inc.	Berne, Ind.	59446	Teler, Inc.	St. Paul, Minn.	76433	General Instrument Corp.,	Newark, N.J.
03954	Singer Co., Diehl Div.,	Somerville, N.J.	11237	Chicago Telephone of California, Inc.	So. Pasadena, Calif.	59730	Thomas & Betts Co.	Elizabeth, N.J.	76487	James Millen Mfg. Co., Inc.	Malden, Mass.
04009	Arrow, Hart and Hegeman Elect. Co.	Hartford, Conn.	11242	Bay State Electronics Corp.	Waltham, Mass.	60741	Triplet Electrical Inst. Co.	Bluffton, Ohio	76493	J.W. Miller Co.	Los Angeles, Calif.
04013	Taurus Products	Lambertville, N.J.	11312	Microwave Electronics Corp.	Palo Alto, Calif.	61775	Union Switch and Signal, Div. of	Pittsburgh, Pa.	76530	Monadnock Mills	San Leandro, Calif.
04062	Elmenco Products Co.	New York, N.Y.	11534	Duncan Electronics Inc.	Costa Mesa, Calif.	62119	Universal Electric Co.	Owosso, Mich.	76545	Mueller Electric Co.	Cleveland, Ohio
04222	Hi-Q Division of Aerovox	Myrtle Beach, S.C.	11711	General Instrument Corp., Semiconductor Div.,	Newark, N.J.	63743	Ward-Leonard Electric Co.	Mt. Vernon, N.Y.	76654	Oak Manufacturing Co.	Crystal Lake, Ill.
04354	Precision Paper Tube Co.	Chicago, Ill.	11717	Imperial Electronic, Inc.	Buena Park, Calif.	64959	Western Electric Co., Inc.	New York, N.Y.	77068	The Bendix Corp.	No. Hollywood, Calif.
04404	Dynac Division of Hewlett-Packard Co.	Palo Alto, Calif.	11870	Metals, Inc.	Palo Alto, Calif.	65092	Weston Inst. Div. of Daystrom, Inc.	Newark, N.J.	77075	Pacific Metals Co.	San Francisco, Calif.
04651	Sylvania Electric Products,	Mountain View, Calif.	12136	Philadelphia Handle Co.	Camden, N.J.	66295	Wittek Mfg. Co.	Chicago, Ill.	77221	Phaonstrian Instrument and	South Pasadena, Calif.
04713	Motorola, Inc., Semiconductor Prod.,	Phoenix, Arizona	12587	Closatrol Mfg. Co.	Dover, N.H.	66346	Revere Wollensak Div. Minn. Mining & Mfg. Co.	St. Paul, Minn.	77252	Philadelphia Steel and Wire Corp.	Philadelphia, Pa.
04732	Fitron Co., Inc., Western Div.	Colver City, Calif.	12697	Nagpon Electric Co., Ltd.	Tokyo, Japan	70276	Allen Mfg. Co.	Hartford, Conn.	77342	American Machine & Foundry Co.	Princeton, Ind.
04773	Automatic Electric Co.	Northlake, Ill.	12881	Metex Electronics Corp.	Clark, N.J.	70309	Allen Mfg. Co.	Hartford, Conn.	77630	TRW Electronic Components Div.	Camden, N.J.
04796	Sequora Wire Co.	Redwood City, Calif.	12930	Delta Semiconductor Inc.	Newport Beach, Calif.	70318	Almetal Screw Product Co., Inc.	Garden City, N.Y.	77638	General Instrument Corp., Rectifier Div.	Brooklyn, N.Y.
04811	Resistor Coil Spring Co.	El Monte, Calif.	13103	Thermofloy	Dallas, Texas	70485	Atlantic India Rubber Works, Inc.	Chicago, Ill.	77764	Resistance Products Co.	Harrisburg, Pa.
04870	P.M. Motor Company	Westchester, Ill.	13396	Tiefelkuen (G.M.B.H.)	Hanover, Germany	70563	Amperite Co., Inc.	Union City, N.J.	77969	Rubbercraft Corp. of Calif.	Torrance, Calif.
05006	Twentieth Century Plastics, Inc.	Los Angeles, Calif.	13835	Midland-Wright Div. of Pacific Industries, Inc.	Kansas City, Kansas	70903	Belden Mfg. Co.	Chicago, Ill.	78189	Shakeproof Division of Hinos	Elgin, Ill.
05277	Westinghouse Electric Corp.	Youngwood, Pa.	14089	Sem-Tech	Calif. Resistor Corp.	70988	Bird Electronic Corp.	Cleveland, Ohio	78283	Signal Indicator Corp.	New York, N.Y.
05347	Ultronix, Inc.	San Mateo, Calif.	14133	Calif. Resistor Corp.	San Jose, Calif.	71002	Burbach Radio Co.	New York, N.Y.	78290	Stuthers-Dunn Inc.	Pittsford, N.Y.
05593	Illimetric Engineering Co.	Sunnyvale, Calif.	14238	American Components, Inc.	Conshohocken, Pa.	71041	Boston Gear Works Div. of	Quincy, Mass.	78452	Thompson-Bremer & Co.	Chicago, Ill.
05616	Cosmo Plastic	Cleveland, Ohio	14483	Hewlett-Packard Company	Loveland, Colo.	71218	Bed Radio, Inc.	Wilmington, Ohio	78471	Tilley Mfg. Co.	San Francisco, Calif.
05624	Barber Colman Co.	Rockford, Ill.	14655	Connell Dublier Electric Corp.	Newark, N.J.	71285	Camloc Fastener Corp.	Paramus, N.Y.	78488	Stackpole Carbon Co.	St. Marys, Pa.
05728	Tiltron Optical Co.	Long Island, N.Y.	14950	Williams Mfg. Co.	San Jose, Calif.	71313	Cardwell Condenser Corp.	Lindenhurst, L.I., N.Y.	78493	Standard Thomson Corp.	Waltham, Mass.
05729	Metro-Tel Corp.	Plainsville, N.Y.	15203	Webster Electronics Co.	New York, N.Y.	71400	Bussmann Mfg. Div. of	St. Louis, Mo.	78553	Tinnerman Products, Inc.	Cleveland, Ohio
05783	Stewart Engineering Co.	Santa Cruz, Calif.	15291	Adjustable Bushing Co.	N.Hollywood, Calif.	71436	Chicago Condenser Corp.	Chicago, Ill.	78790	Transformer Engineers	San Gabriel, Calif.
05820	Wakefield Engineering Inc.	Wakefield, Mass.	15558	Micon Electronics	Garden City, Long Island, N.Y.	71447	Calif. Spring Co., Inc.	Pico-Rivera, Calif.	78947	Uconite Co.	Newtownville, Mass.
06004	The Basicssk Co.	Bridgeport, Conn.	15772	Twentieth Century	Coil Spring Co.	71450	CTS Corp.	Elkhart, Ind.	79136	Waldes Kohnoor Inc.	Long Island City, N.Y.
06175	Bausch and Lomb Optical Co.	Rochester, N.Y.	15818	Amelco Inc.	Mt. View, Calif.	71468	ITT Cannon Electric Inc.	Los Angeles, Calif.	79142	Weeder Rod, Inc.	Hartford, Conn.
06402	E.T.A. Products Co. of America	Chicago, Ill.	15909	McGraw-Edison Co.	Long Island City, N.Y.	71471	Cinema Engineering Co.	Burbank, Calif.	79251	Wenco Mfg. Co.	Chicago, Ill.
06475	Western Devices Inc.	Burbank, Calif.	16037	Spruce Pine Mica Co.	Spruce Pine, N.C.	71482	C.P. Clare & Co.	Chicago, Ill.	79727	Continental-Wirt Electronics Corp.	Philadelphia, Pa.
06540	Amaton Electronic Hardware Co., Inc.	New Rochelle, N.Y.	16688	Ideal Prec. Meter Co., Inc.	Brooklyn, N.Y.	71590	Centralab Div. of Globe Union Inc.	Chicago, Ill.	79963	Zverick Mfg. Corp.	New Rochelle, N.Y.
06555	Beede Electrical Instrument Co., Inc.	Pennacook, N.H.	16758	Delca Radio Div. of G.M. Corp.	Kokomo, Ind.	71616	Commercial Plastics Co.	Chicago, Ill.	80031	Mepto Division of Sessions	Morrisstown, N.J.
06666	General Devices Co., Inc.	Indianapolis, Ind.	17109	Thermometrics Inc.	Canoga Park, Calif.	71700	The Cornish Wire Co.	New York, N.Y.	80120	Schnitzer Alloy Products Co.	Elizabeth, N.J.
06751	Nuclear Corp. of America	Phoenix, Ariz.	17474	Tranex Company	Mountain View, Calif.	71744	Chicago Miniature Lamp Works	Chicago, Ill.	80130	Times Telegraph Equipment	New York, N.Y.
06812	Torrington Mfg. Co., West Div.	Van Nuys, Calif.	18476	Ty-Car Mfg. Co., Inc.	Holliston, Mass.	71753	A.O. Smith Corp., Crowley Div.	West Orange, N.J.	80131	Electronic Industries Association, Any brand	Tube meeting EIA standards-Washington, D.C.
06899	Elite-McCollough Inc.	San Carlos, Calif.	18486	Radio Industries	Oes Plaines, Ill.	71984	Dow Corning Corp.	Midland, Mich.	80207	Unimax Switch, Div. Maxon	Wallingford, Conn.
07083	Kelvin Electric Co.	Van Nuys, Calif.	18593	Carlis Instrument, Inc.	Mt. Kisco, N.Y.	72136	Electro Motive Mfg. Co., Inc.	Providence, R.I.	80223	United Transformer Corp.	New York, N.Y.
07115	Corning Glass Works	Bradford, Pa.	18873	E.I. DuPont and Co., Inc.	Wilmington, Del.	72136	Electro Motive Mfg. Co., Inc.	Providence, R.I.	80294	Oxford Electric Corp.	Chicago, Ill.
07126	Digitran Co.	Pasadena, Calif.	19315	The Bendix Corp.,	Teterboro, N.J.	72354	John E. Fast Co., Div. Victoreen Instr. Co.	Chicago, Ill.	80411	Burns Laboratories, Inc.	Riverside, Calif.
			19500	Thomas A. Edison Industries,	Div. of McGraw-Edison Co.	72619	Dialight Corp.	Brooklyn, N.Y.	80485	All Star Products Inc.	Defiance, Ohio
			19701	Electra Mfg. Co.	Independence, Kansas	72656	Indiana General Corp., Electronics Div.	Neasby, N.J.	80509	Avery Adhesive Label Corp.	Monrovia, Calif.

Table 6-22. Code List of Manufacturers

Code No.	Manufacturer	Address	Code No.	Manufacturer	Address	Code No.	Manufacturer	Address	Code No.	Manufacturer	Address
80583	Hammarlund Co., Inc.	New York, N.Y.	83821	Lloyd Scruggs Co.	Festus, Mo.	93369	Robbins and Myers, Inc.	New York, N.Y.	98731	General Mills, Inc.	Minneapolis, Minn.
80640	Stevens, Arnold, Co., Inc.	Boston, Mass.	84171	Arco Electronics Inc.	Great Neck, N.Y.	93410	Stevens Mfg. Co., Inc.	Mansfield, Ohio	98821	North Hills Electronics, Inc.	Glen Cove, N.Y.
81030	International Instruments Inc.	Orange, Conn.	84396	A.J. Giesener Co., Inc.	San Francisco, Calif.	93788	Howard J. Smith Inc.	Port Monmouth, N.J.	98925	Semiconductor Div. of Clevite Corp.	Waltham, Mass.
81073	Grayhill Co.	LaGrange, Ill.	84411	TRW Capacitor Div.	Ogallala, Neb.	93929	G.V. Controls	Livingston, N.J.			
81095	Triad Transformer Corp.	Venice, Calif.	84970	Sarkes Tarzian, Inc.	Bloomington, Ind.	94137	General Cable Corp.	Bayonne, N.J.			
81312	Winchester Electronics Co., Inc.	Norwalk, Calif.	85454	Boonton Molding Company	Boonton, N.J.	94144	Raytheon Co., Comp. Div.,	Quincy, Mass.	98978	International Electronic	Burbank, Calif.
81349	Military Specification	85471	A.B. Boyd Co.	San Francisco, Calif.		Ind. Comp. Operations		99109	Columbia Technical Corp.	New York, N.Y.
81115	Wakor Products, Inc.	Cleveland, Ohio	85474	R.M. Bracamonte & Co.	San Francisco, Calif.	94148	Scientific Electronics Products, Inc.	Loveland, Colo.	99313	Varian Associates	Palo Alto, Calif.
81463	International Rectifier Corp.	El Segundo, Calif.	85660	Koiled Kords, Inc.	Hamden, Conn.			Newark, N.J.	99515	Marshall Ind. Elect. Products Div.	San Marino, Calif.
81541	The Airpax Products Co.	Cambridge, Mass.	85911	Seamless Rubber Co.	Chicago, Ill.	94154	Tung-Sol Electric, Inc.		99707	Control Switch Division, Controls Co.	El Segundo, Calif.
81860	Barry Controls, Div. Barry Wright Corp.	Watertown, Mass.	86197	Clifton Precision Products Co., Inc.	Clifton Heights, Pa.	94197	Curtiss-Wright Corp.	East Paterson, N.J.	99800	Delevan Electronics Corp.	East Aurora, N.Y.
82342	Carler Precision Electric Co.	Skokie, Ill.	86579	Precision Rubber Products Corp.	Dayton, Ohio	94222	South Chester Corp.	Chester, Pa.	99848	Wilco Corporation	Indianapolis, Ind.
82347	Sperry-Faraday Inc., Cooper Hewitt	Hoboken, N.J.	86684	Radio Corp. of America, Electronic	Harrison, N.J.	94310	Tro-Dim Products	Bellwood, Ill.	99934	Renbrandt, Inc.	Boston, Mass.
82347	Electric Div.		87216	Phelco Corporation (Lansdale Division)	Lansdale, Pa.	94330	Wire Cloth Products, Inc.		99942	Helfman Electronics Corp.	El Monte, Calif.
82347	Jeffers Electronics Division of					94682	Worcester Pressed Aluminum Corp.	Worcester, Mass.	99957	Semiconductor Div.	
82370	Speer Carbon Co.	Du Bois, Pa.	87473	Western Fibrous Glass Products Co.	San Francisco, Calif.					Technology Instrument Corp.	Newbury Park, Calif.
82370	Fairchild Camera & Inst. Corp.,	Clifton, N.J.	87664	Van Waters & Rogers Inc.	San Francisco, Calif.	95023	George A. Philbrick Researchers, Inc.	Boston, Mass.			
82209	Defense Prod. Division		87930	Tower Mfg. Corp.	Providence, R.I.	95236	Atiles Products Corp.	Miami, Fla.			
82219	Maguire Industries, Inc.	Greenwich, Conn.	88140	Cutler-Hammer, Inc.	Lincoln, Ill.	95238	Continental Connector Corp.	Woodside, N.Y.			
82219	Sylvania Electric Prod. Inc.	Emporium, Pa.	88220	Gould-National Batteries, Inc.	St. Paul, Minn.	95263	Leecraft Mfg. Co., Inc.	Long Island, N.Y.			
82376	Aston Division, Remwell Industries Inc.	East Newark, N.J.	88421	Federal Telephone & Radio Corp.	Clifton, N.J.	95264	Lerc Electronics, Inc.	Burbank, Calif.			
82389	Switchcraft, Inc.	Chicago, Ill.	88698	General Mills, Inc.	Buffalo, N.Y.	95265	National Coil Co.	Sheridan, Wyo.			
82647	Metals & Controls Inc.		89231	Graybar Electric Co.	Oakland, Calif.	95275	Vitramon, Inc.	Bridgeport, Conn.			
	Spencer Products	Attleboro, Mass.	89473	General Electric Distributing Corp.		95348	Gordos Corp.	Bloomfield, N.J.			
82768	Phillips-Advance Control Co.	Joliet, Ill.			Schenectady, N.Y.	95354	Methode Mfg. Co.	Chicago, Ill.			
82866	Research Products Corp.	Madison, Wis.	89665	United Transformer Co.	Chicago, Ill.	95712	Dage Electric Co., Inc.	Franklin, Ind.			
82877	Rolton Mfg. Co., Inc.	Woodstock, N.Y.	90179	US Rubber Co., Consumer Ind. & Plastics	Chicago, Ill.	95987	Weckesser Co.	Chicago, Ill.			
82893	Vector Electronic Co.	Glendale, Calif.		Prod. Div.	Passaic, N.J.	96067	Huggins Laboratories	Sunnyvale, Calif.			
83053	Western Washer Mfg. Co.	Los Angeles, Calif.	90970	Bearing Engineering Co.	San Francisco, Calif.	96095	Hi-Q Div. of Aerovox Corp.	Olean, N.Y.			
83058	Car Fastener Co.	Cambridge, Mass.	91260	Concor Spring Mfg. Co.	San Francisco, Calif.	96256	Thordarson-Meissner Div. of				
83086	New Hampshire Ball Bearing, Inc.	Peterborough, N.H.	91345	Miller Dial & Nameplate Co.	El Monte, Calif.		Maguire Industries, Inc.		0000F	Malco Tool and Die	Los Angeles, Calif.
			91418	Radio Materials Co.	Chicago, Ill.	96295	Solar Manufacturing Co.	Los Angeles, Calif.	0000M	Western Coil Div. of Automatic	Redwood City, Calif.
83125	General Instrument Corp.,		91506	Augal Inc.	Attleboro, Mass.	96330	Carlton Screw Co.	Chicago, Ill.	0000Z	Willow Leather Products Corp.	Newark, N.J.
	Capacitor Div.	Darlington, S.C.	91637	Dale Electronics, Inc.	Columbus, Nabr.	96341	Microwave Associates, Inc.	Burlington, Mass.	000AA	British Radio Electronics Ltd.	Washington, D.C.
83148	ITT Wire and Cable Div.	Los Angeles, Calif.	91662	Elco Corp.	Willow Grove, Pa.	96501	Excel Transformer Co.	Oakland, Calif.			England
83186	Victory Engineering Corp.	Springfield, N.J.	91737	Grenar Mfg. Co., Inc.	Wakefield, Mass.	97464	Industrial Relating Ring Co.	Irvine, N.J.	000AB	ETA	
83298	Bendix Corp., Red Bank Div.	Red Bank, N.J.	91827	K F Development Co.	Redwood City, Calif.	97539	Automatic & Precision Mfg.	Englewood, N.J.	000AK	Siemens-America	White Plains, N.Y.
83315	Hubbell Corp.	Mundelein, Ill.	91929	Honeywell Inc., Micro Switch Div.		97979	Reon Resistor Corp.	Yonkers, N.Y.	000BB	Precision Instrument	
83330	Smith, Herman H., Inc.	Brooklyn, N.Y.			Freeport, Ill.	97983	Lifton System Inc., Adler-Westric	New Rochelle, N.Y.	000BB	Components Co.	Van Nuys, Calif.
83385	Central Screw Co.	Chicago, Ill.	91961	Nahn-Bros. Spring Co.	Oakland, Calif.		Commun. Div.		000MM	Rubber Eng. & Development	Hayward, Calif.
83501	Gavitt Wire and Cable Co.	Chicago, Ill.	92180	Tru-Connector Corp.	Peabody, Mass.	98141	R-Tronics, Inc.	Jamaica, N.Y.	000NN	A "N" D Mfg. Co.	San Jose, Calif.
	Div. of Amerace Corp.	Brookfield, Mass.	92367	Elgett Optical Co., Inc.	Rochester, N.Y.	98159	Rubber Teck, Inc.	Gardena, Calif.	000QQ	Cooltron	Oakland, Calif.
83594	Burroughs Corp.		92196	Universal Industries, Inc.		98220	Francis L. Moseley	Pasadena, Calif.	000SS	Control of Elgin Watch Co.	Burbank, Calif.
	Electronic Tube Div.	Plainfield, N.J.			City of Industry, Calif.	98278	Microdot, Inc.	So. Pasadena, Calif.	000WW	California Eastern Lab.	Burlington, Calif.
83740	Eveready Div. National Carbon	New York, N.Y.	92607	Tensolite Insulated Wire Co., Inc.	Tarrytown, N.Y.	98291	Seslectro Corp.	Redwood City, Calif.	000YY	S.K. Smith Co.	Los Angeles, Calif.
83777	Model Eng. and Mfg., Inc.	Huntington, Ind.	93332	Sylvania Electric Prod. Inc.		98405	Carad Corp.				
				Semiconductor Div.	Woburn, Mass.						

THE FOLLOWING H-P VENDORS HAVE NO NUMBER ASSIGNED IN THE LATEST SUPPLEMENT TO THE FEDERAL SUPPLY CODE FOR MANUFACTURERS HANDBOOK.

0000F Malco Tool and Die Los Angeles, Calif.
0000M Western Coil Div. of Automatic Redwood City, Calif.
0000Z Willow Leather Products Corp. Newark, N.J.
000AA British Radio Electronics Ltd. Washington, D.C.
000AB ETA England
000AK Siemens-America White Plains, N.Y.
000BB Precision Instrument Components Co. Van Nuys, Calif.
000MM Rubber Eng. & Development Hayward, Calif.
000NN A "N" D Mfg. Co. San Jose, Calif.
000QQ Cooltron Oakland, Calif.
000SS Control of Elgin Watch Co. Burbank, Calif.
000WW California Eastern Lab. Burlington, Calif.
000YY S.K. Smith Co. Los Angeles, Calif.

APPENDIX I - MANUAL CHANGES

This manual applies directly to 5100A Frequency Synthesizers having serial number prefix 540. This manual with the following changes also applies to 5100A Frequency Synthesizers having serial prefix numbers 351, 401, 408, 420, 427, 442, and 520. To adapt this manual to instruments with serial number prefixes other than 540, note changes as follows:

Instrument Serial No. Prefix	Change No.
520	1
442	1, 2
427, 420	1, 2, 3
408	1, 2, 3, 4
401	1, 2, 3, 4, 5
351	1, 2, 3, 4, 5, 6

Note: 1850-0153 is the recommended replacement for Q1 in all
~~the~~ P/N 05100-6039 Mixer Board Assemblies (A21A2).
 2100-0941 is the recommended replacement for R15 in
 all Multiplier Board Assemblies (A13-A18A1).

CHANGE 1: Figure 5-17 , Assemblies A5-A11A2, 05100-6024

C81 was 47 pf, ~~the~~ Part No. 0160-0334
 C82 was 80 pf, ~~the~~ Part No. 0160-0335
 R66 was 1200 ohms, ~~the~~ Part No. 0683-1225
 R62 was 220 ohms, ~~the~~ Part No. 0683-2215
 L69 was 10 μ Hy ~~the~~ Part No. 05100-6214

CHANGE 2: Figure 5-17 , Assemblies A5-A11A1, 05100-6023

C33 was .01 μ f, ~~the~~ Part No. 0160-2055
 R23 replaces C31, 8-50 pf, ~~the~~ Part No. 0130-0017

Figure 5-18, Assembly A12A1, 05100-6023

C33 was .01 μ f, ~~the~~ Part No. 0160-2055
 R23 replaced C31, 8-50 pf, ~~the~~ Part No. 0130-0017

Figure 5-17 , Assemblies A5-A11A2, 05100-6024

RT1 was deleted
 CR54, CR55, CR56 were added between emitter of Q54 and ground
 R66 was 1800 ohms ~~the~~ Part No. 0683-1825
 R67 was 150 ohms, ~~the~~ Part No. 0757-0284
 C80 was 160 pf, ~~the~~ Part No. 0140-0218

Figure 5-18 , Assembly A12A2, 05100-6047

R63 was 1620 ohms, ~~the~~ Part No. 0757-0428
 R64 was 1000 ohms, ~~the~~ Part No. 2100-0755

Figure 5-29, Assembly A24A1, 05100-6044

R16 was 3300 ohms, ~~the~~ Part No. 0758-0010

Figure 5-30, Series Number on A25 module was 330 Assembly A25A2, 05100-6032

R11, R15 were 499 ohms, ~~the~~ Part No. 0698-0022
 CR1, CR2 were 6.2V breakdown, ~~the~~ Part No. 1902-0081

CHANGE 4: Figure 5-29

A24 Module was series 330, Assembly A24A1, 05100-6044

C41, C44 were .02 μ f, ~~the~~ Part No. 0150-0012
 C42, C43, were 1000 pf, ~~the~~ Part No. 0140-0152

APPENDIX (cont'd)

CHANGE 5: Table 1-1. Specifications

Cable Assembly furnished was ~~CP~~ Part No. 05100-6157/8
05100-6157/8

CHANGE 6: Figures 5-17 and 5-18, Assemblies A5-A12A1, 05100-6023

Q5 was 2N963, ~~CP~~ Part No. 1850-0119

R15 was 1000 ohms, ~~CP~~ Part No. 0683-1025

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